

Annex G: Case studies – Consultants' background reports

The following background reports present the consultants' findings from the various case studies. In order to allow readers to access case studies of particular interest to them, the background reports are included in the following annex to the evaluation report. It should be noted that the background reports are not seen as evaluation sub-reports or similar, and by implication are not subject to Danida guidelines for evaluation reports.

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Rating system for evaluation questions

All projects subject to a field visit or a desk case review were analysed against a standardized case study rating system to enable comparability in their performance against the judgement criteria (JC) and indicators set out under the EQs. The rating system was based on a set of quantitative indicators that determined the rating assigned for each project, a standard best practice to minimise evaluator bias.¹ Accordingly, the team designed the simplified three-tier 'traffic light' rating system below.

Rating Scale	
	Satisfactory: Evaluation criteria have been substantially met with only minor shortcomings with the EC.
	Partly Satisfactory: Evaluation criteria have been partially met but there are significant shortcomings with the EC.
	Unsatisfactory: Evaluation criteria have not been met
N/A	rating not applicable

¹ AfDB, for example, has a 'development objective' rating system that uses four ratings: i) highly satisfactory, ii) satisfactory, iii) unsatisfactory and iv) highly unsatisfactory. The rating is assigned based on the % achievement of a given target.

Case study: Bangladesh

1 Bangladesh: Saidabad Water Treatment Plant – Phase II



Overview

<i>Key issues, highlights and lessons learnt</i>
<ul style="list-style-type: none"> Well implemented water treatment plant that is operating at capacity Follow on Phase III project will double overall Saidabad capacity Pollution problems in dry season at Sarulia




<i>Summary</i>			
Project name	Saidabad Water Project, Phase II		
Type of project	Water treatment		
Project No.	104.O.30.Bangladesh		
Description	<p>The Phase II project aims at improving the water supply of Dhaka through the provision of a new water treatment plant (WTP) at Saidabad, which would increase the present capacity by 225.000 m³/day and supplement a similar plant (fully operational since mid-2002) constructed with financial support from the World Bank, Japan and France. The contract was a design-build contract between the joint venture MT Højgaard A/S /Degrémont JV and Dhaka Water Supply and Sewerage Authority (DWASA) covering:</p> <ul style="list-style-type: none"> A conventional water treatment plant of a capacity of 225.000 m³ per day A pre-treatment plant with a capacity of 450.000 m³ per day to be shared with Phase I Rehabilitation work of raw water pumping station at Sarulia A raw water lifting station at Saidabad 10.3 km of transmission main with appurtenances <p>The project had three components: <u>Component 1</u> a treatment plant with a capacity of 225.000 m³/day of drinking water. Included 9 km transmission lines, water meters, pressure-reducing valves, etc. This follows similar capacity Phase I project. Investment of DKK 540m (71% of total) <u>Component 2</u> included a new water intake with a capacity of 900.000 m³/day, as well as pumping stations, drains, substation, buildings and approximately 10 km of transmission lines. The capacity of the new water intake will ensure the water supply for all three phases of the Saidabad Water Project, so that the water intake that supplies the first phase is closed. Investment of DKK 176m (23%) <u>Component 3</u> included leakage studies to identify necessary repair/rehabilitation work in the system as well as materials therefor. Investment of DKK 43m (6%)</p> <p>The technical assistance in the preparatory phase included, inter alia, the preparation of environmental impact assessment (EIA), design and tender documents and project management. In addition, the technical assistance includes a full-time monitoring consultant during the implementation phase. Against this background, it is considered that the necessary capacity can be established within the project organisation for implementation, operation and maintenance.</p> <p>There were also plans to extend the system with some 8km of 1.000 mm dia. transmission pipelines and 1km of 600 mm dia. secondary distribution pipelines, including electronic bulk water meters, pressure reducing valves, etc. under the Phase II project.</p>		
Sector	Water and sanitation		
Country	Bangladesh		
Sponsor	Dhaka Water Supply and Sanitation Authority (DWASA)		
Other stakeholders	Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC)		
Clearance in principle	Updated screening note June 2004		
Approval/Binding Commitment	6 June 2005 Increase Sept 2009	Loan Agreement Date	31 March 2010
Danish Bank	Nordea Bank		

Summary																					
Loan Duration + Grace Period	Loan amount (net of DSIF cash grant) €61,4m Repayments begin on starting point 15 October 2012 over 10 years																				
Project Amount and funding plan	<table border="1"> <thead> <tr> <th colspan="2"></th> <th>DKK m</th> </tr> </thead> <tbody> <tr> <td>Component 1</td> <td>Water treatment plant</td> <td>540</td> </tr> <tr> <td>Component 2</td> <td>Water intake from Shitalakhya River</td> <td>176</td> </tr> <tr> <td>Component 3</td> <td>Leakage studies and repairs</td> <td>43</td> </tr> <tr> <td>Total</td> <td></td> <td>759</td> </tr> </tbody> </table>								DKK m	Component 1	Water treatment plant	540	Component 2	Water intake from Shitalakhya River	176	Component 3	Leakage studies and repairs	43	Total		759
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	<p>Financial plan</p> <table border="1"> <tbody> <tr> <td>Government of Bangladesh (land clearing)</td> <td>194</td> </tr> <tr> <td>Sida (component 2)</td> <td>145</td> </tr> <tr> <td>Danida (components 1 and 3)</td> <td>420</td> </tr> <tr> <td>Total</td> <td>759</td> </tr> </tbody> </table> <p>The contract negotiations between MTH/Degremont and DWASA have now been concluded with a total of approximately EUR 75,65 million (against an estimated budget of EUR 67,3 million) There is therefore a budget overrun of around 12%. As mentioned above, the overrun is mainly due to the more expensive solution for the pre-treatment plant. If you look at the water system in isolation, it is only a 2% budget overrun.</p>						Government of Bangladesh (land clearing)	194	Sida (component 2)	145	Danida (components 1 and 3)	420	Total	759							
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Danish Exporter	MT Hojgaard A/S (Denmark) in joint venture with Degremont SA (France)																				
EKF guarantee	Date		Amount		Duration																
Implementation status	Completed and handed over January 2013																				
Feasibility study	August 2007																				
Subsidy – rationale and key features	<p>The Project is not viable in financial terms. However, the impact on the financial situation of DWASA will however be positive due to the substantial increase in the tariffs, which at least partially will be made possible by the Saidabad 2 project. The main reason for this is the fact that the Saidabad 2 project will considerably improve the supply security and quality of water, particularly during the dry season. This amounts to a type of quality improvements that most customers are willing to pay for.</p> <p>DWASA's total revenues in the 2003/2004 financial year were USD 37 million, of which approximately 2/3 comes from the sale of water. Revenues generally cover current operating expenses and DWASA's accounts have shown a smaller surplus over the past five years. A financial analysis of the investment over 20 years shows, with a discount rate of 6 per cent, that the investment has a negative present value of approximately USD 42 million and an internal return (FIRR) of 1,2%.</p>																				
Country Context	<p>With an estimated population of around 11 million, the capital, Dhaka, is one of the world's most populous cities. Dhaka is the political and commercial centre of Bangladesh and, due to relatively high migration, on track to reach more than 20 million inhabitants by 2020.</p> <p>The city's water management is largely based on groundwater basins, located under built-up areas. Over-utilisation of existing reserves has meant that land has fallen by several metres a year. The authorities in Bangladesh have therefore developed a comprehensive water supply programme for Dhaka based on the purification of surface water from nearby rivers. In order to increase the water supply, the establishment of the Saidabad Water Project has been started in three phases with a total capacity of 900.000 m³/day. The first phase, with the establishment of a treatment plant with a capacity of 225.000 m³/day was completed in 2002. This project represents the second phase of the Saidabad Water Project with a similar capacity to the first phase, while the third phase is further into the future.</p> <p>Based on a 2003 analysis, it is estimated that the majority of people in Dhaka have access to water, either directly through the DWASA system or other supply, such as individual wells. However, the city's poorest and slum residents do not have these options but can buy water from other supply points typically operated by NGOs or private individuals. However, the price of water is typically up to five times the DWASA tariff, which means that the real access of the very poorest to clean drinking water is limited. In order to improve the situation of the very poorest part of the population, it is recommended to provide technical assistance to DWASA for the analysis of the water market with recommendations on the formalisation of the market, subsidisation, etc.</p>																				

Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>Bangladesh is classified by Danida as a 'poor stable country' and eligible for DSIF support. As set out in the AR and project document (PD), Saidabad II aligns, inter alia, with following MFA policies:</p> <ul style="list-style-type: none"> • Due to low tariffs and high water losses in the poorly maintained distribution network, the project cash flow cannot service a commercial or normal export credit. • There are at least 4 possible Danish contractors with the necessary international experience to construct the WTP. • The project meets Danida's overall objective of poverty reduction, as the project provides the basis for economic growth through improving health in general and thereby reducing poverty. • The project is expected to benefit women and children in particular, as it is mostly women and children who are responsible for bringing water to the family. • The project is also expected to contribute to the improvement of the environment, in particular in limiting the reduction of the scarce groundwater reserve. • According to the World Bank, the GNI per capita in 2006 was \$570, a long way under the \$ 3.895 DSIF limit. <p>JC Rating -  Satisfactory – good alignment with MFA development policies and strategy.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	
<p>Saidabad II is sponsored by Dhaka Water Supply and Sanitation Authority (DWASA) an agency within the Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC). The project is aligned with the following national development policies and plans:</p> <p><u>National Policy for Safe Water Supply & Sanitation 1998</u></p> <p>The objectives to improve the standard of public health and to ensure improved environment. The steps to be taken include:</p> <ul style="list-style-type: none"> • facilitating access of all citizens to basic level of services in water supply and sanitation; • promoting sustainable water and sanitation services; • ensuring proper storage, management and use of surface water and preventing its contamination; <p><u>National Water Policy - January 30, 1999</u></p> <p>The key objective that provides context for Saidabad II is 'To ensure the availability of water to all elements of the society including the poor and the underprivileged, and to take into account the particular needs of women and children. It then states that the policy of the Government is to, inter alia, 'Facilitate availability of safe and affordable drinking water supplies through various means, including rainwater harvesting and conservation.'</p> <p>According to an Asian Development Bank review² Dhaka in the early 2000s was a "water crisis city" characterised by:</p> <ul style="list-style-type: none"> • Growing demand while groundwater table falling • Aged pipes (piped water supply started from 1874) • Poor water quality • Plenty of unidentified leakages and illegal connections • Limited access of low-income communities • 40% of water leaving treatment plants in Dhaka was not billed, due primarily to leakages and inadequate metering and billing leading to high revenue losses for DWASA <p>In summary, GoB's priorities for the water sector are enshrined in national policy, which aims to "ensure access to clean drinking water and sanitation at an affordable level for all residents, with a view to improving public health and ensuring an improved environment".</p> <p>JC Rating  Satisfactory – Good alignment with GoB national development policies and strategies</p>	
JC 1.3 Added value of Project Preparation Facility (PPF)	
JC Rating - Not applicable – not used	
JC 1.4 Complementarity with development partners operations and strategies	
The following key donors have through DWASA supported the water and sewage sector in Dhaka:	

² Asian Development Bank - Water Supply & User Charges Innovation –Dhaka 24x7 Water Supply Case Study 26 November 2018, http://mohua.gov.in/upload/uploadfiles/files/14%20ADB_Dhaka%20Water%20Supply_Sanjay_Joshi.pdf

<p>Japan - Between 1993 and 1996 Japan (JICA) supported the modernisation and rehabilitation of a sewage treatment plant in Dhaka.</p> <p>World Bank approved in 1996 the \$176m Fourth Dhaka Water Supply Project³ with DWASA were: a) to commence an institutional reform program; b) to increase the life of existing assets and reduce water losses; c) strengthen water resources management; and d) to increase potable water supply to 500.000 people The project was cancelled early in 2002 due to implementation problems. The appraisal report⁴ described in detail the lack of capacity in water treatment as well as the poor condition of the 1.260 km water supply distribution system extends over some 1.260 km. At that time DWASA had only 160.000 service connections.</p> <p>It noted that the existing sewerage system was unable to cope with wastewater volumes and raised the issue of how doubling the supply of potable water with Saidabad II would lead to even greater wastewater treatment challenges. It commented that while there was a Sewerage Master Plan, there were no firm construction plans and no financing has been secured so far.</p> <p>In 2020 the World Bank approved \$170 million to improve sanitation services in Dhaka city benefiting around 1,5 million people⁵. The project will help construct a new Sewage Treatment Plant at Pagla area with a capacity of treating about 150 million litres of domestic wastewater per day.</p> <p>Asian Development Bank supported the \$213 Dhaka Water Supply Sector Development Program that began in 2008 to bring reforms to Bangladesh's urban water services sector, build capacity of Dhaka's water utility, and to reach out to the poor and slums.</p> <p>As part of the field visit work, the Particip consultant in Bangladesh summarised the DWASA projects currently underway based on data on its Bangla web site. This is attached as Report 4 in the field visit report.</p> <p>The support highlights the complimentary nature of other donor support as it largely focusses on wate water (sewage) treatment. However, the AR and PD do not explicitly address the issue raised by the WB that Saidabad would double the water supply to DWASA's customers that after use becomes sewage and wastewater that has to be treated.</p> <p>JC Rating -  Satisfactory although the AR and PD should have addressed the need for wastewater treatment capacity to be increased alongside the construction of Saidabad II.</p>
<p>JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts</p> <p>While outcomes such as increasing access to piped potable water and poverty reduction are not well articulated, the expected development outcomes and impacts were high. Saidabad I very quickly after being commissioned in 2001 was operating at full capacity. The justification for II thereby doubling potable water treatment capacity is therefore strong. Moreover, even with II access to piped water will be restricted to a small proportion of Dhaka's rapidly growing population.</p> <p>JC Rating  Satisfactory Saidabad II was a higher development outcome/impact project.</p>
<p>EQ 1 Overall Rating  Satisfactory Saidabad II was an appropriate project that was important to Bangladesh and complied with the DSIF's eligibility criteria. A more integrated development rationale would have been appropriate.</p>

<p>EQ 2 -Coherence</p>	<p>To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?</p>
<p>JC 2.1 Systematic research for coherence with MFA development policies and strategy</p>	<p>The AR and PD both discuss the coherence for Saidabad II with Danida eligibility criteria. Bangladesh is classified by Danida as a 'poor stable country' and eligible for DSIF support. The project meets Danida's overall objective of poverty reduction, as the project provides the basis for economic growth through improving health in general and thereby reducing poverty.</p> <p>It is also coherent with the following principles for project selection:</p> <ul style="list-style-type: none"> • Due to low tariffs and high water losses in the poorly maintained distribution network, the project cash flow cannot service a commercial or normal export credit. • There are Danish contractors with the necessary international experience to construct the WTP. • The project is also expected to contribute to the improvement of the environment, in particular in limiting the reduction of the scarce groundwater reserves which provided at least 80% of potable (although quality and contamination is a major concern) water in Dhaka. • It follows on from the Phase I project that is running at full capacity. <p>JC Rating -  Satisfactory - good coherence with MFA development policies and strategy.</p>
<p>JC 2.2 Synergies /complementarity with other Danish development initiatives</p>	<p>The Bangladesh-Denmark Partnership (BDP) 2005 – 2009 identifies four areas in its cooperation programme one of which is 4.2 Water Supply and Sanitation Sector Support that accounts for Between 20% to 25% of proposed budget. Of relevance to Saidabad the BDP sets out 2009 targets of :</p>

³ <https://projects.worldbank.org/en/projects-operations/project-detail/P009482>

⁴ World Bank, Staff Appraisal Report, Bangladesh, Fourth Dhaka Water Supply Project, November 22, 1996


⁵ <https://projects.worldbank.org/en/projects-operations/project-detail/P161432> The Dhaka Sanitation Improvement Project

- The proportion of population in the target area with access to improved sanitation increased to 90 per cent.
 - The proportion of population with access to safe drinking water increased to 90 per cent.
- It notes that 'Denmark has been supporting the water supply and sanitation sector in Bangladesh since 1972.' For the four-year BDP period: 'The planned programme support is expected to contribute to the fulfilment of the MDG targets related to water supply and sanitation, i.e. to reduce by half the proportion of the population without sustainable access to safe water supply and sanitation.'

5.2 of the BDP discusses Mixed Credits (DSIF) – 'Efforts are being made to pursue Mixed Credits initiatives in areas such as airport facilities, physical infrastructure, electrical transmission lines, large scale urban water supply etc. As Danish support to piped water schemes in core urban areas and major roads will be phased out, the mixed credits instrument will provide a basis for support in these areas. Through the ongoing and planned projects, experience will be gained on the cooperation with both the government and the private sector regarding utilisation of mixed credits schemes.


Prospects are fairly positive and the portfolio might expand over the country strategy period.'


No evidence of coordination with IFU in AR, perhaps because the focus of DSIF was public sector while IFU worked with private sector projects.



JC Rating -  Satisfactory – The Saidabad II project is complementary to the overall Bangladesh Denmark development framework and well-integrated.


JC 2.3 Danish business links with beneficiary countries

The Ar states that- There are at least 4 possible Danish suppliers with international experience, who would be able to implement this project. Locally available after sales service would be a requirement for entering into a contract with the supplier. This should however not be a problem, taking into account the size of the contract, and the potentials of the Bangladeshi market in general for equipment and material in the water and sewage sector.'

JC Rating -  Satisfactory – The Saidabad II project developed Danish business links in Bangladesh, in particular an opportunity for a Danish contractor and possible exports of Danish water treatment plant equipment.

EQ 2 Overall Rating -  Satisfactory – The Saidabad II project was well integrated into the Bangladesh-Denmark Partnership (BDP) 2005 – 2009. It also provides export opportunities for Danish contractors and equipment suppliers.

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
Financial additionality was limited as the financial plan for the project shows.	
	DKKm
Government of Bangladesh (land clearing)	194
Sida water intake from Shitalakhya River	145
DSIF water treatment plant + leakage repairs	420
Total	759
The project was divided into three components of which DSIF funded two components the WTP (DKKm 377) and repairs to leaky transmission pipes. Sida funded the water intake. DSIF did not mobilise any funding from commercial or development banks. DSIF's financial additionality was principally in the form of concessional funding and grants, which were important given the poor financial condition of DWASA and the negative financial rate of return.	
JC Rating -  Satisfactory – even though financial additionality was limited to concessional funding and grants it was necessary as the project was not commercially viable.	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
The project document proposed technical assistance (TA) to the buyer during the preparation and implementation phases:	
<ul style="list-style-type: none"> • preparation of environmental impact assessment (EIA), design and tender documents and project management. • a full-time monitoring consultant during the implementation phase. 	
In addition, DSIF's due diligence process may also be considered as having brought value to Saidabad through the use of international consultants.	
JC Rating -  - Satisfactory – proposed TA for EIA and monitoring consultant appropriate.	
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	
JC Rating - N/A No mobilisation of commercial or development bank funding.	

EQ 5 Overall Rating -  Satisfactory although financial additionality limited to concessional funding and grants these were necessary as the project was not commercially viable. Non-financial additionality in the form of proposed implementation TA was appropriate.


EQ 6 - Effectiveness What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?

JC 6.1 Satisfactory implementation of infrastructure projects

MFA approval of the project was in May 2010 with construction working beginning the next month. Completion and handover occurred in January, 2013⁶. A feasibility study for Saidabad III was prepared in April 2014 shortly after the end of the one year no defects period. This study made clear that the even operating at full capacity, which it has been, a substantial increase in water treatment capacity was urgently required to meet the demands of DWASA's customers. Saidabad III as well as being equal to I and II combined would also involve a new raw water source on the Meghna river for all three WTPs so that the existing polluted source from the Sarulia intake was no longer required. The study makes clear that II was satisfactorily implemented in terms of actual water processing volumes and was working at capacity.

Field visit meetings and Skype calls with DWASA officials confirmed that II:

- was well implemented
 - is state of the art in design
 - is working well
 - uses mainly European equipment including Danish Grundfos pumps that are very good.
- A visit by Particip to the water treatment plant and the Serulia raw water intake confirmed that it was reliable and working well.

JC Rating –  Satisfactory implementation. The intake water quality issue was identified during the appraisal but there was no alternative source at that time.

JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)

The driving force for Saidabad Phase II was that Phase I completed in 2002 was running at full capacity, therefore the need for additional capacity. Moreover, from an environmental perspective providing reliably clean piped water as widely as possible in Dhaka and moving away from underground sources that reduce the water table and provide water of poor or variable quality was another key factor. Articulating expected outcomes in measurable developmental objectives was not well addressed in the AR or PD which set out target outputs and outcomes for the project and the following indicators to track them.

Output


- Installed cleaning capacity (m3/day)
- Number of days of operation – utilisation
- Training of O&M staff
- Leak Detection and Repair.

Outcome




- Annual production (m3/day or year)
- Supply cover (number of households or persons supplied)
- Water quality (standard met or not)

According to the DAC criteria outcomes 5 and 17 should be classified as output indicators. With the exception of indicator 6 the focus is on technical performance and operational efficiency rather than outcomes. Indicator 5 supply cover, while in general an appropriate outcome measurement tool, is not specific in terms of what increase in customer connections can be attributed to the project. Moreover, it is unclear whether water supplied will be going to poorer communities that currently take water from wells or other sources.



Despite these reporting and monitoring weaknesses, there is good evidence that there were positive development outcomes. At a macro level, the launch of phase III demonstrates that the demand for safe drinking water in Dhaka continues to grow rapidly. Second, the field visit included a visit to the Water Supply for LIC (Low Income Community) Project, that oversees a number of NGOs helping to improve access to water and sanitation in poor parts of Dhaka. DWASA is perceived as doing a good job in bringing affordable piped water into these areas.

JC Rating -  Satisfactory – While development reporting was not well designed, the implementation of phase III shows that DWASA is increasing access to piped drinking water across Dhaka. Moreover, low-income communities are being connected.

⁶ Verification at the end of the Defects Notification Period - monitoring the Implementation of Saidabad Water Treatment Plant Project -- Phase II, EnviClim Net, January 2014

JC 6.3 Environmental, social and governance (ESG) risk management
<p>In general, a WTP that is designed to increase the reliable supply of piped potable water by DWASA in a city where more than 80% of the population gets water from underground wells, many of which are polluted⁷, should deliver significant environmental benefits. The AR noted that 'DWASA is only partially fulfilling its mandate to provide sufficient water of good quality to the city, sewage is only supplied to a very minor part of the city, and storm water facilities are generally not up to standards, resulting in considerable economic losses caused by flooding.' Saidabad, however, had specific challenges to delivering such benefits:</p> <ul style="list-style-type: none"> • Identifying a river source of raw water of acceptable quality (ammonia contamination in the dry season was identified as a concern). A pre-treatment plant at the river source was therefore required (funded by Sida). • High levels of leakage (around 30%) in the transmission pipes in the DWASA network • No specific approved plans to increase distribution and customer connections, particularly to poorer parts of Dhaka. <p>Bangladesh's 1997 Environment Conservation Rules classified I projects such as this WTP and intone of four categories depending upon environmental impact and location. These categories are: (i) Green, (ii) Orange A, (iii) Orange B, and (iv) Red. According to these regulations, , water treatment plants and pipeline projects have been placed under Red category.</p> <p>Due to the complexity of the project, it is considered necessary to provide comprehensive technical assistance (TA) to DWASA during the preparation and implementation phase. The TA planned for the preparatory phase includes, inter alia, the preparation of environmental impact assessment (EIA), design and tender documents and project management. In addition, the technical assistance includes a full-time monitoring consultant during the implementation phase. Against this background, it is considered that the necessary capacity can be established within the project organisation for implementation, operation and maintenance to ensure that the WTP functions as designed and that there is careful monitoring of the pre-treatment plant to ensure that the raw water being treated is not contaminated .</p> <p>The field visit found that the water treatment plant is well run and maintained. Moreover, there is increasing access to piped water in poor areas of Dhaka reducing the use of informal water sources such as bore holes, which have adverse environmental effects. The Sarulia raw water intake plant was also visited in June when there were no pollution issues affecting water quality.</p> <p>JC Rating -  Satisfactory – proper consideration has been given to ESG issues, including the major risk of contaminated raw water supplies that have necessitated a pre-treatment plant.</p>
JC 6.4 Contribution to climate change mitigation, green and inclusive development
<p>The main expected environmental benefits of Saidabad I were:</p> <ul style="list-style-type: none"> • Shifting from ground water to surface water should lead to safer, cleaner water compared with surface water wells that may be contaminated with heavy metals and other contaminants. • Increasing potable water supplies using raw water from rivers may reduce the risk of aquifer depletion. • Improvements in the quality and quantity of water supplied should not only lead to higher consumer satisfaction in general but also improved health and contribute to better social conditions. <p>On the negative side the piped sewerage system is already incapable of handling current wastewater volumes. It covers about 20% of the urbanised area. Out of the total wastewater generated only some 5% or 60.000 m3/day of wastewater reaches the existing treatment plant with a capacity of 120.000 m3/day due to deficient mains. Doubling the volume of piped water supplied by DWASA will increase further pressure on the system. noted for, which affects both the level of supply and the financial situation of the enterprise, and there are serious weaknesses regarding the understanding of the value of the water produced, and of the cost of water losses.</p> <p>The field visit found that overall, the project has had a small but positive effect on green development as there is less dependence on bore holes and other informal sources of drinking water.</p> <p>JC Rating -  Satisfactory –Saidabad II WTP has on balance contributed modestly to climate change mitigation, green and inclusive development.</p>
JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth
<p>This project was approved in 2005, 14 years before the HP. JC Rating - N/A</p>
<p>EQ 6 Overall Rating -  Satisfactory Although insufficient attention was given in the appraisal report to identifying and quantifying development outcomes, as confirmed by the field visit the project has delivered positive impacts for the population of Dhaka and improve water and sanitation. The project was well implemented and the water treatment plant is working well. Environmental issues were well analysed and proposed ESG management is good</p>

⁷ AR - 3.4.1 Basic service level situation – A major problem at national level is the problem of the high arsenic content in the water originating from shallow tube wells in large parts of the country. Heavy consumption of ground water through deep tube wells for irrigation, and in the case of the major cities for piped water supply or private water supply and industrial use, has lowered the water table in many parts of the country below the effective reach of tube wells, and is thereby threatening the high level of safe water supply achieved in many parts of the country. Especially for the slum dwellers of Dhaka this is an increasing problem, as the hand tube wells they had earlier relied on either draw no water or draw contaminated water.

EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)	
<p>The indicators that were set out in the AR and PD were:</p> <p>Output</p> <ul style="list-style-type: none"> • Installed cleaning capacity (m3/day) • Number of days of operation – utilisation • Training of O&M staff • Leak Detection and Repair. <p>Outcome</p> <ul style="list-style-type: none"> • Annual production (m3/day or year) • Supply cover (number of households or persons supplied) • Water quality (standard met or not) <p>All of these except for number 6 are in fact output indicators, as defined by the DAC criteria. Such output indicators are subject to monitoring and verification reports prepared by the M&V consultant appointed by DSIF. The mandate and work of this consultant ended with the issue of the Verification and End of Defect Liability report in January 2014 which certified that the WTP was working properly and, inter alia, delivering the specified 225.000 m3/day.</p> <p>There is monitoring of development outcomes such the supply cover to ascertain whether the planned ultimate beneficiaries were being reached.</p> <p>The field visit included a visit to the Water Supply for LIC (Low Income Community) Project, that oversees a number of NGOs helping to improve access to water and sanitation in poor parts of Dhaka. DWASA is doing a good job in bringing affordable piped water into these areas. Phase III which is at the design stage will double the output of the Saidabad treatment plants enabling the expansion of the DWASA network to continue.</p> <p>JC Rating - -  Satisfactory – While development reporting was not well designed, the field visit found that phase II is working well and that, inter alia, low-income communities are being connected.</p>	
JC 7.2 Strong ESG performance of DSIF projects	
<p>The planned environmental impact assessment was not available.</p> <p>The major environmental concern throughout construction and commissioning has been the quality of the raw water that goes into the pre-treatment plant. Extracts from reports prepared by monitoring and verification consultant appointed by DSIF show that this problem had not been resolved:</p> <ul style="list-style-type: none"> • First Monitoring visit, in May 2012 – ‘...2/3 of the pre-treatment plant is already in operation since the raw water (also for Phase I) is highly polluted, especially with ammonia.’ • Verification and End of Defect Liability report in January 2014 – ‘Raw water quality: The concern of water raw water quality remains, and a long-term solution would still be to supply raw water from other rivers.’ <p>In addition, in preparation for the appraisal of Saidabad III consultants⁸ were tasked in 2014 with reviewing II to ascertain lessons that should be taken into account for III. It found that: ‘The quality of water produced is satisfactory as well, except for parts of the dry season when the raw water quality deteriorates... Water quality: The target values were achieved, except for part of the dry season, related to deterioration of the raw water quality...Unfortunately the raw water supply quality deteriorated beyond the design parameters of the project, making the pre-treatment plant ineffective during part of the dry season.’ As result III will source water 30km away from another river. This new source will also supply phases I and II making obsolete the existing pre-treatment plant.’</p> <p>In terms of overall performance reported on the ended with the issue of the Verification and End of Defect Liability report in January 2014 which certified that the WTP was working properly and, inter alia, delivering the specified 225.000 m3/day.</p> <p>The field visit found no evidence of adverse environmental performance. The Sarulia raw water intake plant was not having to deal with contaminated water.</p> <p>JC Rating -  - Satisfactory – While there are problems with raw water quality in the dry season, which appears relatively short so that on annual basis Saidabad II is performing to an acceptable standard. The field visit found that DWASA is committed to deal with any raw water contamination issues if they arise. Moreover, the raw water quality issue should be resolved with the new river source for III which will be able to supply phases I and II as well.</p>	

⁸ 2014-10-24, Draft Review Report Saidabad II, NIRAS


JC 7.3 Satisfactory financial returns and portfolio performance


At the time Saidabad II was implemented in 2013 DWASA's financial position and profitability was still relatively weak due to low water tariffs and high water losses due to poorly maintained pipes and infrastructure. According to the Asian Development Bank⁹, since 2007, however, there has been a significant turnaround in the financial and operating performance of DWASA. Key financial turnaround indicators include:

- Annual tariff increase of 5% every year since 2007 (GOB approved tariff increase by 17% for domestic users and 13% for commercial users effective from 1 Nov. 2016). Acceptance of such tariff increases may be linked to the perceived value of reliable safe potable water that even low-income customers can afford.
- Net profits of Tk 111 million (\$1,4 million) in FY2014 compared with loss of Tk 670 million (\$8,6 million) in FY2008.

	2008	2015
Unbilled water losses (%)	40	22
Revenue collection (%)	64,5	97,5

If the trend continues, DWASA may be able to borrow commercially in the medium term and be less dependent on concessional funding.

JC Rating -  Satisfactory - There has been a significant turnaround in the financial and operating performance of DWASA. If the trend continues, DWASA may be able to borrow commercially in the medium term and be less dependent on concessional funding. Partially satisfactory – DWASA profitability and financial condition likely to remain fragile, continuing its dependence on donor support.

EQ 7 Overall Rating  Satisfactory – Despite Insufficient focus on development reporting, the field visit found that the WTP performing as planned and that DWASA's network expansion includes access to low-income communities in Dhaka. ESG management has been acceptable. Financial performance has been improving.

EQ 8 Sustainability

Have DSIF projects been economically, socially and environmentally sustainable?

JC 8.1 Level of economic viability

Many of the benefits in economic terms are possible to describe but more difficult to estimate in monetary terms. A case in point is the fact that high rate of ammonia and heavy metals found in the drinking water produced by Saidabad 1 during the dry season could over time have negative health repercussions. By improving the quality of the raw water (with the help of the new raw water intake to be constructed under the project) this health hazard will be eliminated. In the AR an economic rate of return of 3,6% is presented, a little higher than the FRR of 1,2%.

While not directly related to Saidabad II, an in-depth review of DWASA conducted by Asian Development Bank in 2017 and 2018 of projects that it had supported, concluded that there had been an 'Institutional Transformation' of DWASA which was more profound, wide ranging and effective than would have been thought possible 10 years earlier when it was started. Key findings about the performance of DWASA include:


- System turnaround: rehabilitating the existing distribution network and household connections¹⁰ with Dhaka divided into performance-based contracts for NRW reduction, and trenchless-technologies
- Implementation of a non-revenue (unbilled) water reduction project for the half areas of Dhaka city.
- Rehabilitation of networks and connections, including building a capability to detect and reduce leaks, and deliver clean water 24 hours a day to everyone, including the poor.
- Expanding services to the poor and low-income communities through standpipes and communal taps.
- Distribution network improvements:
 - Over 5 million people benefitted from uninterrupted 24/7 and pressurized water supply; and good quality water potable directly from taps.
 - Improved access of 150.000 people in low-income communities.
 - 5 million people benefitted from uninterrupted 24/7 access to potable water.
 - Reduced physical water losses sin transmission lines to 5%.
- 2016 Citizen Report Card Survey in all 11 DWASA zone found that

⁹ The Dhaka Water Services Turnaround – ADB Review 2017; and Asian Development Bank - Water Supply & User Charges Innovation –Dhaka 24x7 Water Supply Case Study 26 November 2018, http://mohua.gov.in/upload/uploadfiles/files/14%20ADB_Dhaka%20Water%20Supply_Sanjay_Joshi.pdf.

¹⁰ This included dividing Dhaka into 145 district metered areas (DMAs) that could be more easily managed with closer contact with local communities.

- 82% of the respondents reported no service failure in the previous 12 months and 12% noted only one service failure.
- 44% said that the compatibility between their bills and services received was “good”; 36% found the value for services “acceptable.”
- As a service provider, DWASA was rated “good” by 47% of those who replied to the survey.
- Volume, pressure, continuity of supply, and quality of water, the majority said, was “excellent” (2%), “very good” (18%), or “good” (37%).
- People spend less money on electricity (for water pumping), bottled water, and treatment of waterborne diseases.
- Senior management has a goal that DWASA becomes the ‘...best water utility in the public sector of Asia’. In 2013 DWASA received the Water Leaders’ Award at the Global Water Summit) for its turnaround strategy¹¹.

The field visit found that Phase II was working well and is reliable.

JC Rating -  Partially satisfactory – Modest level of economic viability is a reflection of poor operating efficiency, including high level of leakages and poor billing systems.

JC 8.2 | Level of commercial/financial viability of infrastructure

Construction work began in June 2010 and was completed in January 2013. The final verification report in January 2014 concluded that the plant has now been operated for one year at nominal flow (average) and that the Contractor has delivered a water treatment plant of high quality and tests have been performed to demonstrate that the plant can deliver the nominal flow of water at quality and head pressure stipulated in the contract. It was delivered on budget. The October 2014 Saidabad II Review Report by NIRAS included the following performance indicators:

Saidabad II performance indicators

Output indicators	Unit	Target Value	Achieved value	Without project
Daily water output	m ³ /day	225.000	238.300	0
Achieved compared to target			+5,9%	
Supply coverage	Connections	no target	325.800 (Mid 2013)	311.040 (Mid 2012)
Annual increase in supply coverage			+4.7%	
Acceptable water quality	Yes/no	Several indicators	Yes, except during dry season	N/A


It can be seen that average output is 6% above target. It is unclear whether increase in connections can be attributed to Phase II as the project was still under construction.

The AR states that the Project is not viable in financial terms. However, the impact on the financial situation of DWASA will however be positive due to the substantial increase in the tariffs, which at least partially will be made possible by the Saidabad 2 project. The main reason for this is the fact that the Saidabad 2 project will considerably improve the supply security and quality of water, particularly during the dry season. This amounts to a type of quality improvements that most customers are willing to pay for.

The WTP was operated by the Danish contractor under a three-year operations and maintenance contract until the end of 2015 when it was to be handed over to DWASA. A total of 26 people were trained in two batches during construction period for staff to understand the structures of which many will be permanently covered (by water, sand, lamellas, meteor media) during operation.

The AR projected a financial rate of return or IRR of 1,2% which was based on increases in tariffs. It concluded that even with tariff increases, the project was only marginally viable.

Based on the performance of Phase II, NIRAS recommended that Saidabad III should go ahead. It would have a capacity equal to I and II combined, i.e. twice the capacity of II. Like the AR it recognised the need ‘To increase its revenues by more than the inflation rate and strive towards full cost recovery.’. It also recommended that DWASA operating capability still strengthening in many key areas.

JC Rating -  Partially satisfactory – While the WTP exceeded production output targets, DWASA remains a fragile organisation that is not financially viable. Moreover, its operating capabilities need to be strengthened.

JC 8.3 | Level of improvements in ESG achievement

The findings of the final Verification report and the Niras Review Report of Saidabad II both prepared in 2014 found that:


The concern of water quality remains, and a long-term solution would still be to supply raw water from other rivers. Sulphides are also in high concentration in the raw water during the dry season, resulting in bad smelling water at times, potentially lowering consumer confidence in the product water DWASA is producing. This problem could have been mitigated by having increased the capacity of the pre-treatment plant.


DWASA investment projects are not being adequately monitored by the environmental authorities in Bangladesh.




¹¹ http://www.globalwaterleaders.org/the_award/results/2013

In analysing Gender, the AR commented that access to piped clean water would reduce the amount of time women spend on fetching water, especially in slum areas and during the dry season, and the facilitation of their household work in general.

The field visit found that environmentally the plant is working well. Anecdotally, the field visit confirmed that the social benefits identified in the AR of increased access to clean, safe drinking water in poorer parts of Dhaka are being realised.


JC Rating –  Satisfactory . The field visit found that environmentally the plant is working well. Anecdotally, the field visit confirmed that the social benefits identified in the AR of increased access to clean, safe drinking water in poorer parts of Dhaka are being realised.

EQ 8 Overall Rating  Partially satisfactory While Saidabad II is working well, the overall sustainability of DWASA's operations still need to improve, as evidenced by a review conducted by ADB in 2018.

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
JC 10.1	Quality of risk management systems and policies on long-term sustainability
<p>The AR focused on two major risks:</p> <ul style="list-style-type: none"> • Access to raw water of an acceptable quality and the decision to build a pre-treatment plant at the river source. Of particular concern were high levels of ammonia and other pollutants during the dry season when river levels are lower. • Poor or delayed implementation of institutional and financial reform programmes at DWASA which was judged to be financially weak and have many major operating deficiencies including high leakages in transmission pipes and poor customer billing services. Much of the DWASA infrastructure was in a bad condition. <p>DSIF committed to providing a full-time monitoring and verification consultant to oversee the implementation of Phase II.</p> <p>The emphasis of reporting by DWASA to DSIF was on operating efficiency with little on development outcomes.</p> <p>Both the NIRAS 2014 verification report and the field visit confirmed that the project was well implemented.</p> <p>JC Rating –  Satisfactory - Given the operating and managerial capacity of DWASA the AR concentrated on the most important issues that influenced implementation of Phase II.</p>	
JC 10.2	M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio
<p>The emphasis of reporting by DWASA to DSIF was on operating efficiency with little on development outcomes. The only appropriate outcome indicator (based on DAC criteria) was 'supply cover' relating to the number of water connections to the DWASA network. This was not well defined with an intervention logic demonstrating how Phase II capacity would result in an increase in households and businesses having access to clean piped water. Moreover, the increased pressure on wastewater treatment facilities which even before II could not cope was only addressed in very general terms with no solutions even outlined. DWASA reporting requirements were output concentrated.</p> <p>JC Rating –  Partially satisfactory - Insufficient focus on development outcomes.</p>	
<p>EQ 10 Overall Rating  Partially satisfactory - There was insufficient focus on development outcomes DWASA reporting requirements were output concentrated which while understandable did not address the overall DWASA water and sanitation network and infrastructure.</p>	

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
<p>The emphasis of reporting by DWASA to DSIF was on operating efficiency with little on development outcomes. The result management system at DSIF focuses on outputs. Reporting by the monitoring and verification consultant appointed by DSIF to oversee Phase II implementation ended with the issue of Verification, End of Defect Liability report in January 2014 one year after project completion. This report stated that the WTP was meeting its design output capacity of 225.000 m³/day. It did not provide data on the only DAC compliant outcome indicator to measure the increase in the number of customer connections to DWASA piped potable water.</p>	

The only appropriate outcome indicator (based on DAC criteria) was 'supply cover' relating to the number of water connections to the DWASA network.

JC Rating –  Partially satisfactory – RMS is insufficiently focused on development outcomes. All reporting concentrates on technical output performance indicators.

JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

As already noted, the result management system at DSIF focuses on outputs. Only one of the stated outcome indicators (increase in the number of customer connections) complies with DAC outcome criteria. The AR and PD list the following indicators:


Output


- Installed water treatment/cleaning capacity (m3/day)
- % of days WTP in operation
- Reduction in leakages from transmission pipes -.
- Satisfactory operation of pre-treatment plant
- Operational competence and capacity Training of O&M staff

Outcome

- Water production (m3/day or year)
- Increase number of connected consumer. (number of households or persons supplied)
- Water quality (standard met or not)

The output indicators are appropriate to measure that the WTP is working as planned and delivering the specified daily quantities of potable water. Reporting ended one year after completion in January 2014 with the end of defects and verification report issued by EnviClim Net the monitoring and verification consultant appointed and paid for by DSIF. The M&V reports do not provide data on customer connections.

JC Rating  Partially satisfactory – RMS is output focused. The monitoring and verification consultant reports were all output focused. No reporting on outcomes

EQ 11 Overall Rating  Partially satisfactory – RMS is output focused. The monitoring and verification consultant reports were all output focused. No reporting on outcomes

Field visits and calls

1.1.1 Design of water treatment plant



Water Treatment Plant Photograph from January 2014 Verification at the End of the Defects Notification Period Report



Field Visit Photograph



1.1.2 DWASA Zoom Call 24 April 2021

DWASA

- Mustafizur Rahaman Kamal PMU 5 years since 2009
- Md. Nurujaman, Executive Engineer, SWTPPP-III, DWASA.
- Quaran Naher Laily
- Sultana Raiz PD Saidabad III since 1993 with DWASA
- Mustafa Kamal

Particip:

- Avijit Podar
- Andrew Danino

Phase II where operations started in 2012:

- was well implemented
- is state of the art in design
- is working well
- uses mainly European equipment including Danish Grundfos pumps that are very good.

Phase III was given the go ahead in 2012 with funding for the feasibility study provided by French government TA facility FACIT. It was approved in December 2015 TA. Selection of a project manager for Component 1 (treatment at raw water source on Meghna river and pipeline to Saidabad. Included the scope of work is a master plan for Meghna river.

DSIF will appoint its own design consultant for Component 2 – Saidabad III WTP.

Dhaka is divided into 150 districts for WatSan planning purposes. The current goal is for 50% of Dhaka population to have access to WatSan in 3 phases. At present only 20% of Dhaka's population is connected to sewerage services.

Consideration is being given to '**progressive water tariffs**'.

Working with DSIF:

1. Why was DSIF approached for S II support/finance? – There is a good relationship with Danida and the embassy which dates back to 2006 and it easy to work with.
2. For S III embassy proposed \$100m of support
3. DWASA also works with ADB for sewerage projects
4. How well did DSIF respond to approach/request? - no complaints about professionalism, speed of response and technical competence of DSIF
5. How important was Danish equipment / contractors / technical assistance in decision to approach DSIF? - Most of the equipment used came from European suppliers
6. How important was the financing package (including subsidies) in decision to approach DSIF on S III? The subsidy was good but the tenor of the loan was too short at 15 years compared with soft loans from AFD (25 years) and KfW (38 years)
7. Quality and speed of DSIF appraisal - Local context sometimes not well understood by DSIF, including issues of unplanned development and cleaning up the leather industry

1.1.3 Field Visit Report 1: DWASA Project: Saidabad Water Treatment Plant Project, Phase-II

Date of field work	17 & 21 June 2021 (two days)
Date of submission	23 June 2021

1.1.3.1 Officials met:

1. Engr. Quamrun Nahar Laily, SE & PD, SWTP, Phase-III, DWASA
2. Engr. Wahidul Islam Murad, SE, SWTP, DWASA
3. Engr. Mostafizur Rahman, XEN, DWASA
4. Engr. Md. Nuruzzaman, XEN, DWASA
5. Engr. Masud Hossain, SAE, DWASA (accompanied me in the field)
6. Kazi Maruful Haque, Manager, QHS&E, SWTP (accompanied me in the field)
7. Mohammed Mobarak Hussain, Manager, OP&L, SWTP.

1.1.3.2 Project –II: Basic Information

1	Present condition	:	Saidabad water treatment plant (SWTP) is in operation.
2	Operation commencement	:	2012 (Note: Phase I operation stated in 2002)
3	Intake at Sarulia	:	Nos. of Pump in the take 8 (Note: 3 Pumps of Phase-II & 5 Pumps of Phase-III)

The key finding from the visit is that the treatment plan is reliable. DWASA pays attention to proper operation and maintenance so that it serves the people of Dhaka City.

1.1.3.3 Saidabad II – Sarulia Raw Water Intake

A visit to the Sarulia intake revealed that currently there is no pollution problem. DWASA is, however, alert to protect pollution and adopt monitoring action.



1.1.3.4 Water Treatment Plant II – Field Visit Photographs and Site View





1.1.4 Field Visit Report 2: Water Supply for LIC (Low Income Community) - Dhaka City Corporation

Date of field work	22 June 2021
Date of submission	23 June 2021

1.1.4.1 Overall Findings:

- The poor communities are pleased with DWASA to have a water supply connection but at time of field visit it was not working. The DWASA Engineer reported that other LIC areas are being supplied normally.
- Some projects are in progress of implementation under DWASA with view to improve the access to drinking water and sewerage services.
- The provision of potable water and sewerage are obviously reasonable and affordable for the LIC (low-income committee) as provided by earlier Projects.

1.1.4.2 Basic Information:

1	Project /Program	:	Development of Dhaka WASA Activities in LIC localities including Capacity Building and Financial Modelling Under the framework of Saidabad Phase-III Project.
2	Source of Fund	:	AFD
3	Implementation Period	:	May 2016 to June 2020.
4	Major Activities	:	1) Water Connection 2) Financial Model 3) Training Capacity.
5	Partner NGOs	:	1) DSK 2) BASA 3) SPACE 4) Water & Life Bangladesh.

1.1.4.3 NGO-wise Activity: Information A (Lot-1)

A.1	NGO Name	:	DUSHTHA SHASTHYA KENDRA (DSK) as Lead Partner NAGORIK SHEBA FOUNDATION (NSF) - NAGAR DARIDRA BOSTIBASI UNNAYAN SHNGSTHA (NDBUS) as associate partners. House # 741, Road # 09, Baitul Aman Housing Society, Adabar, Dhaka-1207.
A.2	NGO Contact Person	:	Name: Akhil Chandra Contact No. 01730-023523 Email: dskpehupdhaka@gmail.com
A.3	Contract Value	:	BDT = 39.765.374,00
	Actual Expenditure	:	BDT = 36.058.957,00

A.4	Working area	: Mirpur-12
A.5	Period of Activity	: 19/12/2017 to 30/09/2018
A.6	Population coverage for service	: 18.990 People
A.7	Major Works	: Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

1.1.4.4 NGO-wise Activity: Information B (Lot-2)

B.1	NGO Name	: DUSHTHA SHASTHYA KENDRA (DSK) as Lead Partner Bangladesh Association for Social Advancement (BASA) & Initiative for People's Development (IPD) as associate partners. House # 741, Road # 09, Baitul Aman Housing Society, Adabar, Dhaka-1207.
B.2	NGO Contact Person	Name: Akhil Chandra Contact No. 01730-023523 Email: dskpehupdhaka@gmail.com
B.3	Contract Value Actual Expenditure	: BDT= 28.473.317,00 : BDT= 25.608.617,00
B.4	Working area	: Mirpur-2 (Muktijodha Complex)
B.5	Period of Activity	: 19/12/2017 to 30/09/2018.
B.6	Population coverage for service	: 13.500 People
B.7	Major Works	: Water connection (i) CSP (complex standpoint) -hanging (ii) SSP (simple standpoint)

1.1.4.5 NGO-wise Activity: Information C (Lot-3)

C.1	NGO Name	: Bangladesh Association for Social Advancement (BASA) as Lead Partner and Central Gonounnyan Sangstha (CGS) & Initiatives for People's Development (IPD) JV. House # 113, Road # 06, New DOHS, Mahakhali, Dhaka-1206.
C.2	NGO Contact Person	Name: Milton Mia Contact No.01711329640 (Saiful) Email: miltonbasa@gmail.com
C.3	Contract Value Actual Expenditure	: BDT = 32.773.476,00 : BDT = 30.531.392,00
C.4	Working area	: Mirpur-11 (Bihari Comp)
C.5	Period of Activity	: 19/12/2017 to 30/09/2018.
C.6	Population coverage for service	: 11.952 People
C.7	Major Works	: Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

1.1.4.6 NGO-wise Activity: Information D (Lot-4)

D.1	NGO Name	: DUSHTHA SHASTHYA KENDRA (DSK) House # 741, Road # 09, Baitul Aman Housing Society, Adabar, Dhaka-1207.
D.2	NGO Contact Person	Name: Akhil Chandra Contact No. 01730-023523 Email: dskpehupdhaka@gmail.com
D.3	Contract Value Actual Expenditure	: BDT= 47.780.678,00 : BDT= 43.599.730,00
D.4	Working area	: Mohakhali
D.5	Period of Activity	: 19/12/2017 to 30/09/2018.

D.6	Population coverage for service	: 26.622 People
D.7	Major Works	: Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

1.1.4.7 NGO-wise Activity: Information E (Lot-6)

E.1	NGO Name	: Society for People's Action in Change and Equity (SPACE)- Shobujer Ovijan Foundation (SOF)- M/S Kabir Enterprise (KE) JV House # 695/A, Road # 11, Baitul Aman Housing Society, Adabar, Dhaka-1207.
E.2	NGO Contact Person	Name: Md. Monzu Contact No.01798-033916 Email: mollahtradecom@gmail.com
E.3	Contract Value Actual Expenditure	: BDT = 29.071.860,00 : BDT = 28.890.686,00
E.4	Working area	: Mohakhali
E.5	Period of Activity	: 19/12/2017 to 30/09/2018.
E.6	Population coverage for service	: 12.692 People
E.7	Major Works	: Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

1.1.4.8 NGO-wise Activity: Information F (Lot-7)

F.1	NGO Name	: Bangladesh Association for Social Advancement (BASA) House # 113, Road # 06, New DOHS, Mahakhali, Dhaka-1206.
F.2	NGO Contact Person	Name: Milton Mia Contact No.01711329640 (Saiful) Email: miltonbasa@gmail.com
F.3	Contract Value Actual Expenditure	: BDT = 34.532.454,00 : BDT = 16.088.552,00
F.4	Working area	: Mirpur-11 (Bihari Camp)
F.5	Period of Activity	: 19/12/2017 to 31/12/2018.
F.6	Population coverage for service	: 5.166 People
F.7	Major Works	: Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

1.1.4.9 NGO-wise activity: Information G (Lot-8)

G.1	NGO Name	: Water and Life Bangladesh (W&L) JV Partner Shobar Jonno Pani Ltd (SJP) Jannat Monjil (First Floor), 126/1-B, Senpara Porbota, Ward No. 14, Mirpur-10, Dhaka-1216.
G.2	NGO Contact Person	Name: Md. Sumon Ahmed Contact No. 01815-849369 Email: abul-hossain.summon@waterandlife.ngo
G.3	Contract Value Actual Expenditure	: BDT = 29.066.750,00 : BDT = 18.531.900,00
G.4	Working area	: Mirpur-14 (Vashantek)
G.5	Period of Activity	: 19/12/2017 to 30/04/2020.
G.6	Population coverage for service	: 9.060 People
G.7	Major Works	: ½" diameter piped Water connection

1.1.5 Field Visit Report 3: (visited on 22 June 2021)

1.	Location	: Begam Tila Slum and Raju Basti at East Kurmitala, Ward No. 02, Dhaka North City Corporation, Dhaka
2.	Whom I met and discussed in the slum.	: (i) Nayan, DSK (NGO) Representative. (ii) Afroza, DSK (NGO) accompanied me in the field. Water Connection Customer: (i) Mamotaj, (ii) Malek, (iii) Masum Mia, (iv) Amena.
3.	Observations with information	: A few (3 to 7 family) use the water connection. Multiple connections are made with their own arrangement to get water from each house. Somewhere connection is made in the toilet due to lack of land-space. Supply water is not adequate at present; many customers get water at night only, some customers do not get water at all. some customers do not pay due to getting no water.
4.	Attachment	: Photos of activities and slum.

1.1.5.1 LIC Field Visit Photographs







1.1.6 Field Visit Report 4: Access to Water supply and Sanitation and Drainage system DWASA, Dhaka

Period of work	26 to 30 June 2021 (1-day effectively)
Date of submission	30 June 2021
Reference	Extracted and translated into English from DWASA Website (Bangla version)

1.1.6.1 Access to Water supply and Sanitation and Drainage system: At a glance

ADB supported Project	Water supply	Sl. # 1, 4
China supported Project	Sanitation	Sl. # 2
AFD-KfW-EIB supported	Water supply	Sl. # 3
WB supported Project	Sanitation	Sl. # 5
GOB full supported Project	Drainage	Sl. # 6, 7
GOB full supported Project	Sanitation	Sl. # 8
GOB full supported Project	Water supply	Sl. # 9, 10

Projects under DWASA: Basic information

Sl. No.	Project Name	Implementation Period (to extended)	Source of Fund, Crore BDT	Objective in brief	Physical Progress (%) up to April 2021
1.	Dhaka Environmentally Sustainable Water Supply Project (Revision-1).	Oct-2013 to Dec-2020 to June-2022	Total 8.151 ,17 GOB 26,94 DWASA 14,64 ADB 5.442,64	500 mld surface water treatment and supply.	40
2.	Dasherbandi Faecal Sludge Treatment Project (Revision-1).	Jul-2015 to Jul-2020 to June-2022	Total 3.712,54 GOB 1.336,54 DWASA 10,00 China 2.366,00	<ul style="list-style-type: none"> • Faecal sludge treatment of selected areas under Dhaka City. • Pollution reduction of Intake points at Shitolakkha river for SSWTP Phase-I & II. 	81
3.	Saidabad Water Treatment Project, Phase-III.	Jul-2015 to Jun-2021 to June-2025 (Extension)	Total 4.597,36 GOB 1.513,80 DWASA 30,00 AFD-DSIF-EIB 3.053,56	• 450.000 mld surface water treatment and supply for Dhaka City.	05
4.	Dhaka Water Supply Network Improvement Project.	Apr-2016 to Dec-2023	Total 3.182,30 GOB 1.037,30 ADB 2.145,00	• Water supply network to 7 zones with establishment of DMA.	64
5.	Dhaka Sanitation Improvement Project.	Jan-2020 to Dec-2024	Total 3.855,60 GOB 999,60 WB 2.856,00	• Safely managed sanitation in selected areas of Dhaka City.	73
6.	Excavation/Re-excavation with land acquisition for Hazaribag, Baishteki, Manda and Begunbari Canals (Revision-2).	Apr-2018 to Dec-2022	Total 645,51 GOB 645,51	• Improvement of Canals (5 Nos.).	20
7.	Dhaka City Drainage Network Extension and Canal Improvement Project.	Jul-2018 to Jun-2023	Total 550,50 GOB 550,50	• Improvement of Canals (5 Nos.) with drainage system extension.	74
8.	Land Acquisition for Construction of Faecal Sludge Treatment Plant at Ultra Area, Dhaka.	Jul-2019 to Jun-2021	Total 1.398,00 GOB 1.398,00	• Land Acquisition for Construction of Environmentally Friendly and Sustainable FSTP.	96
9.	Emergency Water Supply Project.	Jan-2020 to Dec-2023	Total 732,32 GOB 732,32	• 447 mld additional ground water supply as emergency.	24
10.	Emergency Replacement of Water Distribution Pipelines in Dhaka City.	Jan-2020 to Jun-2021	Total 48,98 GOB 48,98	• Ensuring of supply adequate potable water and reduction of water pollution.	40

2 Bangladesh: Saidabad Water Treatment Plant – Phase III

Overview

Key issues, highlights and lessons learnt
<p>Project follows on from successful implementation of phase II that is operating at capacity. Will add the equivalent capacity of phases I and II, thereby doubling overall output to 900,000m³ per day. AFD, EIB and KfW are financing the raw water treatment plant and 30km pipeline to Saidabad. France/AFD financed feasibility study</p> <p>Operation of phase III can only begin after pipeline complete, probably in early 2026.</p> <p>Project is at design stage phase after which there will be a tender for a Danish contractor.</p>

Summary			
Project name	Saidabad Water Treatment Plant Project Phase-III		
Type of project	Expansion		
Project No.	2014-9677		
Description	<p>DSIF provided funding for Saidabad Water Treatment Plant, phase II. The project, which was successfully completed, has been in operation since December 2012. Together with Saidabad I, clean water of 450.000 m³ per day is produced for Dhaka. Phase III involves:</p> <p>component 1: establishing a raw water intake at Meghna, about 30 km from Metropolitan Dhaka and construction of a water transmission line from Meghna to Saidabad. All 900.000 m³ water for the 3 WTPs constructed under the three phases will be pumped from Meghna¹². Phase II</p> <p>component 2: construction of a surface water treatment plant at Saidabad, Saidabad III, and sludge treatment facilities for all three water treatment plants at Saidabad; and</p> <p>component 3: construction of 54 km of primary pipes as well as customer connections from Saidabad III.</p>		
Sector	Water and sanitation		
Country	Bangladesh		
Sponsor	Dhaka Water Supply and Sewerage Authority (DWASA)		
Other stakeholders	Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC)		
Clearance in principle	24 April 2015		
Approval/Binding Commitment	13 June 2017	Loan Agreement Date	Not signed
Danish Bank	Danske Bank		
Loan Duration + Grace Period	To be negotiated		
Project Amount and funding plan	As shown in the Appraisal Report table below Phase III is being financed by a consortium of European development finance institution: AFD; DSIF, EIB and KfW.		

¹² Phase II funded by DSIF had raw water pollution problems in the dry season from its source on the Shitalakhya River which have not been resolved, hence the decision to use the cleaner source 30km away identified for Phase III.


Summary																																																																																																								
	Budget - Saidabad III Components and Funding																																																																																																							
		Funding Agency					Total																																																																																																	
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Below is a 2018 updated cost estimate ¹³ using information from the Gandharpur water treatment plant and general cost escalations since 2013 as follows:																																																																																																								
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Overall, the project cost has increased by 28% driven largely by a 129% increase in the intake and pumping station. Component 2, which DSIF is funding, has increased by 19%. Final costs are likely to be even higher given that these are 2018 estimates.																																																																																																								
Implementation status	The most recent implementation schedule for the water treatment plant is set out below.																																																																																																							
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In practice, however, the WTP will not be able to start operations before early 2026 when the pipeline from the Meghna river has been commissioned.																																																																																																								
The GOB signed an agreement with IWM-CEGIS in January 2021 to prepare a PM (master plan) to protect the River Meghna. The IWM (Institute of Water Modelling) and CEGIS (Centre for Environmental and Geographic Information Services) will prepare the MP jointly. The MP will be prepared within 18 months of the day the agreement is signed.																																																																																																								
Feasibility study details	The Feasibility Study Report – Volume-I – Main Report Final, 30 April 2014 (275 pages) and Environmental and Social Impact Assessment 05 March 2014 (172 pages) were prepared ¹⁴ with support from France.																																																																																																							
Subsidy – rationale and key features	DWASA cannot ford to service commercial bank loans for this technically viable project.																																																																																																							
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¹³ Taken from the RFP for Design and Supervision Consultants, provided to Particip in Bangladesh

¹⁴ Egis in France and Institute of Water Modelling in Bangladesh jointly undertook both.

Summary		
	Total grant:	132 976
Country Context	<p>In 2017 Dhaka, the capital of Bangladesh, had a population 15 million, which has been growing at more than 5% per year. Provision of clean water for the population is already posing a serious challenge. At present water supply service is provided intermittently and only covers around 80% of the population. The main raw water source for the city is ground water (78%), but unsustainable rates of abstraction have been causing the ground water levels to decline between 1 and 2 meters per year and to fall below critical levels during the dry season. Dhaka is built on alluvial land only four meters above sea level and sinking by around 14 mm per year due to the unsustainable rate of groundwater extraction, so the threat of saline contamination of the depleted aquifers due to climate change induced sea level rise is severe and increasing. The remainder of the raw water is surface water from the Sitalakhya River, but the quality of this source is rapidly deteriorating, polluted by upstream textile industry effluents and other untreated wastewater discharges. This problem is heavily accentuated during the dry season. Dhaka Water and Sewerage Authority (DWASA) is a public, agency responsible for the construction, operation and maintenance of water supply and sanitation infrastructure in metropolitan Dhaka; including raw ground and surface water supply; surface water treatment plants; water supply distribution networks and sewerage networks; wastewater treatment plants and, storm water drainage services. DWASA aims at shifting the balance of its raw water sourcing from 22% surface water at present to approximately 70% by 2021, with the additional supplies to be mobilized from the relatively unpolluted Meghna River, approximately 30 km East of Dhaka.</p>	

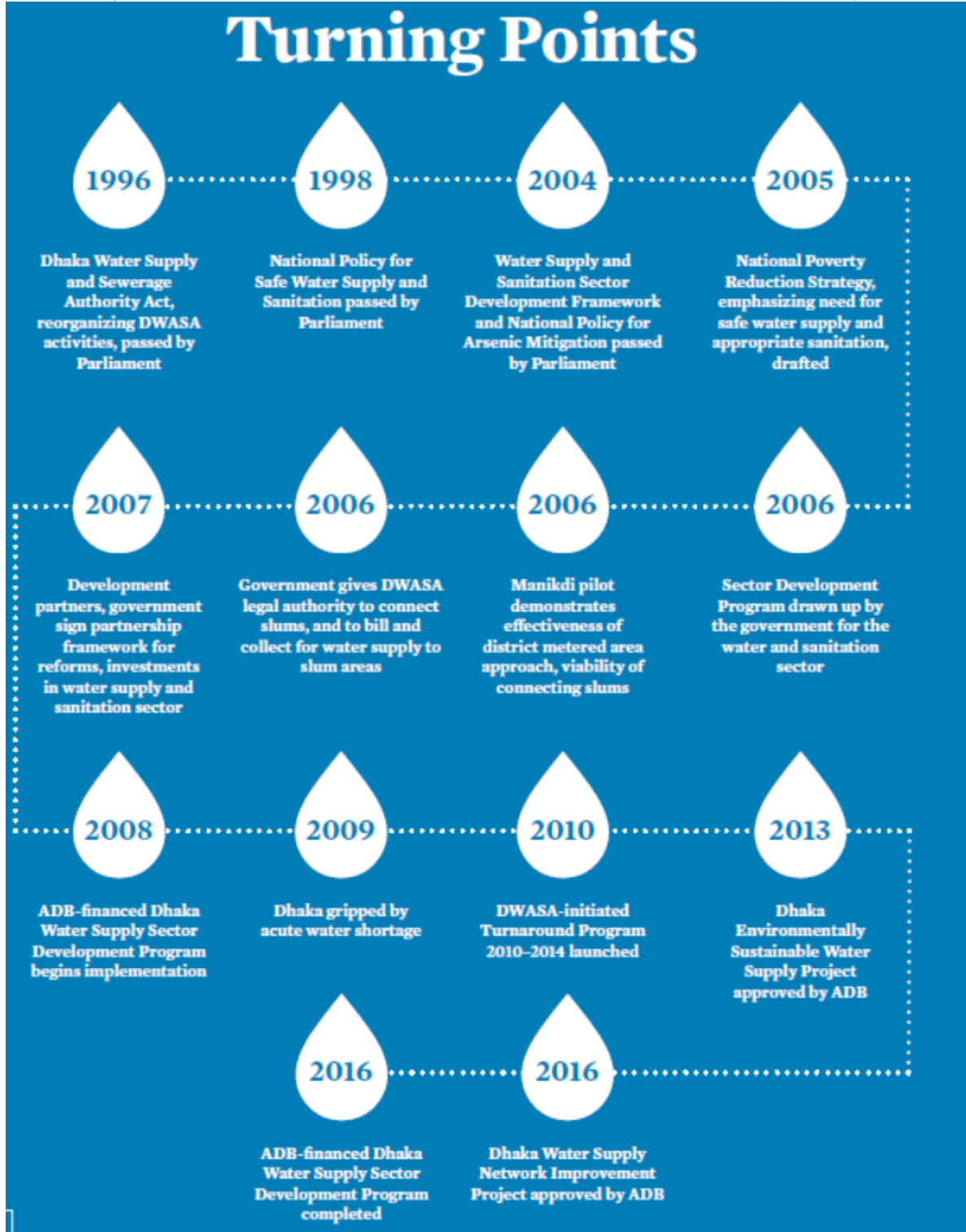
Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1	Alignment with MFA development policies and strategy
<p>The MFA development policy in Bangladesh is set out in the Denmark – Bangladesh Country Policy Paper 2013-2017 (DBCPP). The overall objectives governing Denmark’s engagement in Bangladesh relevant to Saidabad II are to ‘Contribute to poverty reduction, growth and sustainable development, in particular through priority programmes within human rights and good governance; agriculture; water supply and sanitation (WatSan) and business partnerships....The assistance to water supply and sanitation aims at reducing poverty and improving health through improved access to clean drinking water and hygienic sanitation. Support to urban water supply will be continued with financing from mixed credits.’ The DBCPP specifically refers Saidabad.</p> <p>JC Rating -  Satisfactory – good alignment with MFA development policies and strategy.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders’ views into account	
<p>Saidabad III, which follows from Saidabad II, is sponsored by Dhaka Water Supply and Sanitation Authority (DWASA) an agency within the Ministry of Local Government, Rural Development and Cooperatives (MoLGRDC). The project is aligned with the following national development policies and plans:</p> <p>National Policy for Safe Water Supply & Sanitation 1998</p> <p>The objectives to improve the standard of public health and to ensure improved environment. The steps to be taken include:</p> <ul style="list-style-type: none"> • facilitating access of all citizens to basic level of services in water supply and sanitation; • promoting sustainable water and sanitation services; • ensuring proper storage, management and use of surface water and preventing its contamination; <p>National Water Policy - January 30, 1999</p> <p>The key objective that provides context for Saidabad II is ‘To ensure the availability of water to all elements of the society including the poor and the underprivileged, and to take into account the particular needs of women and children. It then states that the policy of the Government is to, inter alia, ‘Facilitate availability of safe and affordable drinking water supplies through various means, including rainwater harvesting and conservation.’</p> <p>Bangladesh Water Act, 2013</p> <p>The BWA deals with the creation of the National Water Resources Council, and: promoting the National Water Policy and National Water Resources Planning, Monitoring and Evaluation; developing and using integrated water resources, balanced water supply, protection and implementation of the water policy; ensuring integrated development of water resources of the National Water Resources.</p> <p>An Asian Development Bank review in 2017 identified DWASA as having the following core problems¹⁵</p> <ul style="list-style-type: none"> • Inadequate supply of clean water to meet rapidly growing demand • Poor quality of water distribution network and high water losses 	

¹⁵ The Dhaka Water Services Turnaround – ADB Review 2017

- Low quality and reliability of water supply and poor service delivery
- Limited coverage of slum dwellers
- Financially unsustainable utility
- Inefficient and ineffective management systems

The following chart from the ADB review¹⁶ shows, inter alia, the evolution of WatSan policy in Bangladesh



JC Rating - Satisfactory – Good alignment with GoB national development policies and strategies

JC 1.3 Added value of Project Preparation Facility (PPF)

¹⁶ It also highlights ADB projects in water and sanitation.

Feasibility study funded by France.
JC Rating - Not applicable

JC 1.4 Complementarity with development partners operations and strategies

Saidabad III was integrated into other investments in DWASA, the overall programme for which was funding by AFD, EIB, KfW and the government (supported by ADB), alongside DSIF.

Budget - Saidabad III Components and Funding						
	Funding Agency					Total
	DSIF	AFD	EIB	KfW	GoB	
	€m	€m	€m	€m	€m	€m
Component 1 – Intake, pumping station plus transmission pipes	-	104	40	76	21	241
Component 2 – Output: Phase III WTPs	188	-	-	-	-	188
Component 3 – Distribution network Rehabilitation and Expansion	-	11	-	14	4	29
Global Costs:						-
Land acquisition and resettlement					22	22
Existing network replacement					4	4
Tax (VAT)					92	92
Total	188	115	40	90	142	575

The following are other development partner supported projects in water and sanitation and involving DWASA that are complimentary to Saidabad III.

- \$450m Sewerage Master Plan in 2012 to increase the treatment of the extra amount of wastewater generated by Saidabad II and other potable water projects. Funding provided by ADB \$250m, AFD \$64m and EIB \$136m
- \$200m Dhaka Water Supply Sector Development Programme in 2013 to provide a new surface water supply scheme, including a new surface water intake, transmission mains, a water treatment plant, networks, and household connections. Supported by ADB.

According to ADB, there was \$1,5 billion of foreign investment in DWASA between 2009–2014.

The table below using data taken from the DWASA website shows Dhaka donor supported progress underway.

Donor Supported Dhaka Water and Sanitation Projects in Progress				
Sl. No.	Project Name	Finish Progress	Dev Partner	Objective in brief
1.	Dhaka Environmentally Sustainable Water Supply Project (Revision-1).	2022 40% complete	ADB	• 500 mld surface water treatment and supply.
2.	Dasherbandi Faecal Sludge Treatment Project (Revision-1).	2022 81% complete	China 2366.00	• Faecal sludge treatment • Pollution reduction at intake points
4.	Dhaka Water Supply Network Improvement Project.	2023 64% complete	ADB	• Dhaka water supply network
5.	Dhaka Sanitation Improvement Project.	2024 73% complete	WB	• Sanitation in Dhaka City.

JC Rating -  Satisfactory – Good complementarity with other programmes supporting DWASA.


JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts


Results framework (RF) is in project document in project document sets out a strong development outcome goal for III:





The population of Dhaka uses a sustainable, environmentally friendly, pro-people, diversified and more climate resilient water supply. Specific targets are:

- More than 7,000,000 people, of which more than 1,000,000 living in low-income communities, have access to at least 100 l/c/d at WHO standards for drinking water.
- More than 40% of the average share of the water supply is surface water

How such objectives can be linked to a water treatment plant in an integrated way is less well set out. While the focus in the RF is more on outputs, it is clear that there is a strong development need for Saidabad III. Moreover, the positive experience in phase II underpins the development rationale for III.

JC Rating -  Satisfactory – The results framework in the project document shows that Saidabad has high potential outcomes and impacts. Moreover, the positive experience in phase II underpins the development rationale for III.

EQ 1 Overall Rating –  Satisfactory Saidabad III was an appropriate project that was important to Bangladesh and complied with the DSIF's eligibility criteria.

EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p>The PD¹⁷ discusses the coherence for Saidabad III with Danida eligibility criteria. Denmark has been supporting the vision of the Government of Bangladesh and its national development plans as articulated in the Vision 2021, the associated Perspective Plan 2010–2021, and the 6th Five Year Plan 2011–2015. It is also coherent with the following principles for project selection:</p> <ul style="list-style-type: none"> • The proposed Saidabad III is commercially non-viable at current DWASA tariff levels. • There are Danish contractors with the necessary international experience to construct the WTP. • The project is also expected to contribute to the improvement of the environment, in particular in limiting the reduction of the scarce groundwater reserves which provided at least 80% of potable (although quality and contamination is a major concern) water in Dhaka. • It follows on from the Phase II project that is running well. • Fits well with overall The Danish support to the water supply and sanitation sectors aims at reducing poverty through implementation of the Sector Development Plan and improving access to drinking water and hygienic sanitation. • Is in line with the 2010 Joint Co-operation Strategy signed by the Government of Bangladesh, Denmark and 17 other development partners¹⁸. • Is in accordance with Denmark's development strategy "The World 2030" for poor and more stable countries, with a focus on gradually shifting from development cooperation to increased political and commercial cooperation. <p>JC Rating -  Satisfactory - good coherence with MFA development policies and strategy.</p>	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p>The Danish Country Programme (2017-2021), sets out Denmark' four overall objectives of which two are relevant to Saidabad:</p> <ul style="list-style-type: none"> • Contribute to poverty reduction, growth and sustainable development, in particular through priority programmes within human rights and good governance; agriculture; water supply and sanitation and business partnerships. • Promote commercial cooperation between Denmark and Bangladesh. <p>The DCP identifies as key sector water supply and sanitation as a key area for support The assistance to water supply and sanitation aims at reducing poverty and improving health through improved access to clean drinking water and hygienic sanitation. Danish support is mainly provided through the Hygiene, Sanitation and Water Fund (HYSAWA) as direct support to local authorities. It states that 'Support to urban water supply will be continued with financing from mixed credits.'</p> <p>JC Rating -  Satisfactory – Saidabad III fits well with the Danish Country Programme (2017-2021).</p>	
JC 2.3 Danish business links with beneficiary countries	
<p>A joint venture between a Danish contractor and a French contractor undertook Saidabad II. While the tender for a Danish contractor for phase III is yet to take place, the experience of Phase II indicates that this should be possible, although like II it may be in a joint venture with a non-Danish contractor with expertise in the water sector. The project is currently at the stage of tendering for design and supervision consultants that will come from Denmark.</p> <p>JC Rating -  Satisfactory – As Saidabad II shows, there are Danish contractors that may be suitable to undertake the construction of the phase III water treatment plant</p>	
<p>EQ 2 Overall Rating -  Satisfactory the Saidabad III project follows the successful implementation of phase II. It aligns well with the current Danish Country Programme (2017-2021) that has as one of its priorities support of the water sector in Bangladesh.</p>	

¹⁷ The 51-page project document which at 51 pages includes the information that would be found in an appraisal report.

¹⁸

https://erd.portal.gov.bd/sites/default/files/files/erd.portal.gov.bd/page/db6db4c7_566d_4b43_9f5a_233b12cace0e/JCS_press_release.pdf

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>The Saidabad III water treatment plant is part of an integrated approach to upgrading all of DWASA’s network and infrastructure, most importantly the main transmission lines, connections to customers and modernising/increasing capacity in the sewerage system so that it can handle both existing wastewater volumes but also much larger amounts that will result from doubling the delivery capacity for potable water. The donor supported programme is in three components of which component 2 (Saidabad III WTP) is being 100% funded by DSIF. The whole €575m programme is being coordinated overseen by ADB which is working with DWASA and the government.</p> <p>It is difficult to claim that DSIF was involved in mobilising ADB or the other development partners (AFD, EIB and KfW).</p> <p>Instead DSIF’s financial additionality was principally in the form of concessional funding and grants, which were important given the poor financial condition of DWASA and the negative financial rate of return.</p> <p>JC Rating - ● Satisfactory – financial additionality limited to concessional funding and grants but necessary given low tariffs.</p>	
JC 5.2 DSIF value (per DAC) or non-financial (MDB’s ‘Harmonized framework’) additionality	
<p>DSIF will be funding a design and supervision consultant. In addition, DSIF’s due diligence process may also be considered as having brought value to Saidabad through the use of international consultants.</p> <p>No evidence of Danish crown and flag influence.</p> <p>JC Rating - ● - Party satisfactory – limited non-financial additionality primarily through funding of design and supervision consultant.</p>	
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	
JC Rating - N/A No mobilisation of commercial or development bank funding.	
EQ 5 Overall Rating – ● - Partially satisfactory. Financial additionality limited to concessional funding and grants. Non-financial additionality in the form of proposed implementation TA is appropriate but limited.	

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?																																																																																																		
JC6.1 Satisfactory implementation of infrastructure projects																																																																																																			
<p>Implementation of the project is yet to begin. The most recent implementation schedule for the water treatment plant is set out below.</p>																																																																																																			
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<p>In practice, however, the WTP will not be able to start operations before early 2026 when the pipeline from the Meghna river has been commissioned.</p> <p>Given the successful implementation of phase II, no major problems are expected in construction of the WTP. There is, however, considerable, implementation uncertainty about the construction of the raw water treatment plant on the Meghna river and laying the 30km dual pipe to Saidabad that must pass through densely populated parts of Dhaka and cross major roads and highways. This may delay the start of operations of the WTP. The key Output Indicators set out in the AR are:</p> <ul style="list-style-type: none"> • 450.000 m3/day of clean water delivered to the network • 54 km of new water supply pipes with connections to consumers in Dhaka <p>JC Rating - N/A construction is yet to begin.</p>																																																																																																			
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)																																																																																																			


Effectiveness: By working with a known partner DWASA¹⁹ in the context of an existing supply system, the assistance can be targeted at expanding the supply to a known recipient base.

The driving force for Saidabad Phase II is that both Phases I and II were running at full capacity, therefore the need for additional capacity. From an environmental perspective providing reliably clean piped water as widely as possible in Dhaka and moving away from underground sources that reduce the water table and provide water of poor or variable quality was another key factor. Set out below are Outcome Indicators that are generic in nature.

- Increasing Dhaka population with access to piped water from DWASA
- Low-income population with access to piped water from DWASA
- Bangladesh countrywide poverty levels

The results framework includes targets and indicators that are generally appropriate. The only outcome indicator that is inappropriate is that tracking the reduction in poverty as attribution would be almost impossible and that it not limited to Dhaka.

A field visit undertaken covering both phases II and III included Despite these reporting and monitoring weaknesses, there is good evidence that there were positive development outcomes. At a macro level, the launch of phase III demonstrates that the demand for safe drinking water in Dhaka continues to grow rapidly. Second, the field work included a visit to the Water Supply for LIC (Low Income Community) Project, that oversees a number of NGOs helping to improve access to water and sanitation in poor parts of Dhaka. DWASA is perceived as doing a good job in bringing affordable piped water into these areas. Phase III will enable DWASA to continue expanding its water and sanitation network in poor neighbourhoods.

JC Rating -  Potentially satisfactory – The successful implementation of phase II coupled with evidence that DWASA is expanding its water and sanitation network in poor neighbourhoods provides confidence for the implementation of phase III.

JC 6.3 Environmental, social and governance (ESG) risk management


As part of the feasibility study an extensive (172 page) environmental and social impact assessment was undertaken in 2014. This it is stated in the PD was in line , including an Environmental and Social Management Plan (ESMP), has been prepared for the whole scheme, in line with the Bangladesh Department of Environment requirements. Environmental impacts and issues during construction and operation are identified and analysed. The ESIA concluded that there would be no significant adverse impacts when operational. It presents a proposed environment management plan (EMP), including a monitoring program (with a preliminary cost estimate) that should be put in place to assess any unexpected adverse environmental impacts on the environment.

A key issue identified was the importance of monitoring the quality of the source water from the pre-treatment plant 30km away on the Meghna, river. The ESIA recommended that the Department of Environment (DoE), DWASA and BIWTA should take pre-emptive measures so that the source water quality is protected against pollution and the riverbanks remain free from illegal land grabbing in future. It stressed that the long-term sustainability of the WTP is dependent on the quality of the source plant.

There was a separate environmental update in 2017²⁰ that provided a technical analysis of the proposed water intake location on the Meghna river. This concluded that ‘Despite the existing and planned industrial developments close to the Haria intake, the site remains the best and only viable location to implement the intake for Saidabad Phase-III among the considered options.’

The field visit included going to the planned water intake where land has been acquired. The GOB signed an agreement with IWM-CEGIS in January 2021 to prepare a PM (master plan) to protect the River Meghna. The IWM (Institute of Water Modelling) and CEGIS (Centre for Environmental and Geographic Information Services) will prepare the MP jointly. The MP will be prepared within 18 months of the day the agreement is signed.

There are two principal environmental challenges: the quality of the water at the intake which make degrade with industrialisation that is likely, and the route across 30km of densely populated neighbourhoods to Saidabad.

JC Rating -  Satisfactory – ESG governance during due diligence. If well managed, Saidabad III should not have significant adverse environmental effects during operation. It is critical to maintain the quality of the raw water source at the Meghna River, 30km from the WTP.




JC 6.4 Contribution to climate change mitigation, green and inclusive development

Overall, the plan to source and transit raw water, treat it, and distribute the treated water will have positive net social and environmental effects. Large benefits accrue from relieving pressure on the ground water supplies and providing potable water to many people whose supplies are currently unreliable or non-existent.

Since the project (component 2) is inter-linked with both the water intake/conveyance (Component 1) and the distribution system (Component 3), the impacts of these other two components are also assessed. Under the supervision of EIB, an Environmental and Social Impact Assessment (ESIA), including an Environmental and Social Management Plan (ESMP), has been prepared for the whole scheme, in line with the Bangladesh

¹⁹ The weaknesses/vulnerabilities in DWASA's technical, managerial and institutional capacity are noted and mitigated through the use of TA.

²⁰ Saidabad Phase III – Environmental update of Technical Analysis of the Water Intake Location from the Feasibility Study - September 2017

<p>Department of Environment requirements. In addition, a Resettlement Policy Framework (RPF) and Resettlement Action Plan (RAP) will be prepared to mitigate and remedy impacts, including through compensation in line with Bangladeshi laws and EIB standards.</p> <p>By improving the management of water infrastructure, the project contributes to Bangladesh's resilience to climate change and natural disasters.</p> <p>JC Rating -  Satisfactory - Overall, the plan to source and transit raw water, treat it, and distribute the treated water will have positive net social and environmental effects. By improving the management of water infrastructure, the project contributes to Bangladesh's resilience to climate change and natural disasters.</p>
<p>JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth</p>
<p>As described in 6.4, the project should help in a modest way enhance climate resilience in Bangladesh.</p> <p>JC Rating -  Satisfactory – Saidabad III complies with the Helsinki Principles.</p>
<p>EQ 6 Overall Rating  Satisfactory - The satisfactory experience with Phase II gives confidence that the planned for outcomes for Phase III are realistic and appropriate. ESG risk management as part of due diligence was good.</p>

<p>EQ 7 Commercial /developmental balance</p>	<p>Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?</p>									
<p>JC 7.1 Satisfactory development outcomes (using DAC definition of impact)</p>	<p>Project construction is yet to begin. The successful implementation of Saidabad II which was commissioned in 2013 shows that DWASA can implement large projects.</p> <p>JC Rating - N/A as project has not yet been built. Potentially satisfactory - The developmental focus in the project document and working alongside experienced development partners, as well as DWASA which has demonstrated its competence in Saidabad II gives confidence that Phase III can deliver the intended development benefits.</p>									
<p>JC 7.2 Strong ESG performance of DSIF projects</p>	<p>An in-depth ESIA was prepared as part of the feasibility study. A later annex analysed the critical issue of raw water quality at the proposed water source. The conclusion was that if well managed there would be no significant adverse environmental effects during operation of the WTP. It proposed a draft an environmental and social management plan that should be followed when the WTP begins operations.</p> <p>Given the proven capability of DWASA it is reasonable to expect that there will be satisfactory ESG performance of Saidabad III.</p> <p>JC Rating - N/A as project has not yet been built. Potentially satisfactory given good preparatory work at the feasibility and due diligence stage coupled with proven capacity and commitment of DWASA indicate that that there will be satisfactory ESG performance of Saidabad III.</p>									
<p>JC 7.3 Satisfactory financial returns and portfolio performance</p>	<p>The proposed Saidabad III was assessed commercially non-viable at DWASA tariff levels pertaining at the time of the feasibility study in 2014 and given the limited average ability to pay by customers in Dhaka at the time of DSIF approval.</p> <p>According to the Asian Development Bank²¹, since 2007, however, there has been a significant turnaround in the financial and operating performance of DWASA. Key financial turnaround indicators include:</p> <ul style="list-style-type: none"> Annual tariff increase of 5% every year since 2007 (GOB approved tariff increase by 17% for domestic users and 13% for commercial users effective from 1 Nov. 2016). Acceptance of such tariff increases may be linked to the perceived value of reliable safe potable water that even low-income customers can afford. Net profits of Tk111 million (\$1,4 million) in FY2014 compared with loss of Tk670 million (\$8,6 million) in FY2008. <table border="1"> <thead> <tr> <th></th> <th>2008</th> <th>2015</th> </tr> </thead> <tbody> <tr> <td>Unbilled water losses (%)</td> <td>40</td> <td>22</td> </tr> <tr> <td>Revenue collection (%)</td> <td>64,5</td> <td>97,5</td> </tr> </tbody> </table> <p>If the trend continues, DWASA may be able to borrow commercially in the medium term and be less dependent on concessional funding.</p> <p>The project cost has increased at least 19% since the appraisal and may increase further. The financial viability of the project remains to be demonstrated.</p> <p>JC Rating - N/A as project has not yet been built. Potentially partly satisfactory - There has been a significant turnaround in the financial and operating performance of DWASA. If the trend continues, DWASA may be able to borrow commercially in the medium term and be less dependent on concessional funding.</p>		2008	2015	Unbilled water losses (%)	40	22	Revenue collection (%)	64,5	97,5
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²¹ The Dhaka Water Services Turnaround – ADB Review 2017; and Asian Development Bank - Water Supply & User Charges Innovation –Dhaka 24x7 Water Supply Case Study 26 November 2018, http://mohua.gov.in/upload/uploadfiles/files/14%20ADB_Dhaka%20Water%20Supply_Sanjay_Joshi.pdf




EQ 7 Overall Rating N/A as project has not yet been built. Potentially satisfactory – Although Saidabad III is yet to be implemented, it is reasonable to posit that there will be an acceptable balance between the development outcomes and financial returns.

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>Although project construction is yet to begin there are encouraging signs that DWASA will be able to implement Saidabad III in an economically viable manner. An in-depth review of DWASA conducted in 2017 and 2018 by ADB of projects that it had supported, concluded that there had been an ‘Institutional Transformation’ of DWASA which was more profound, wide ranging and effective than would have been thought possible 10 years earlier when it was started. Key findings about the performance of DWASA include:</p> <ul style="list-style-type: none"> • System turnaround: rehabilitating the existing distribution network and household connections²² with Dhaka divided into performance-based contracts for NRW reduction, and trenchless-technologies • Implementation of a non-revenue (unbilled) water reduction project for the half areas of Dhaka city. • Rehabilitation of networks and connections, including building a capability to detect and reduce leaks, and deliver clean water 24 hours a day to everyone, including the poor. • Expanding services to the poor and low-income communities through standpipes and communal taps. • Distribution network improvements: <ul style="list-style-type: none"> ○ Over 5 million people benefitted from uninterrupted 24/7 and pressurized water supply; and good quality water potable directly from taps. ○ Improved access of 150.000 people in low-income communities ○ 5 million people benefitted from uninterrupted 24/7 access to potable water ○ Improved access of 150.000 people in low-income communities to ○ Reduced physical water losses sin transmission lines to 5% • 2016 Citizen Report Card Survey in all 11 DWASA zone found that <ul style="list-style-type: none"> ○ 82% of the respondents reported no service failure in the previous 12 months and 12% noted only one service failure. ○ 44% said that the compatibility between their bills and services received was “good”; 36% found the value for services “acceptable.” ○ As a service provider, DWASA was rated “good” by 47% of those who replied to the survey. ○ Volume, pressure, continuity of supply, and quality of water, the majority said, was “excellent” (2%), “very good” (18%), or “good” (37%). ○ People spend less money on electricity (for water pumping), bottled water, and treatment of waterborne diseases. <p>Senior management has a goal that DWASA becomes the ‘...best water utility in the public sector of Asia’. In 2013 DWASA received the Water Leaders’ Award at the Global Water Summit) for its turnaround strategy²³.</p> <p>JC Rating - N/A as project has not yet been built. Potentially satisfactory – the strong operational turnaround, including increasing reliability and customer satisfaction suggest the integrated overall expansion and upgrading of the DWASA water and sanitation network of which Saidabad III is a part may be expected to be economically viable.</p>	
JC 8.2 Level of commercial/financial viability of infrastructure	
I-7.2.1 - AR and monitoring documents comply with on-lending, on-investing conditions.	
<p>As noted in 7.3 there has been a major improvement in the financial performance and condition as a result of higher tariffs, improved billings and other operating efficiencies. DWASA achieved full recovery of operating and maintenance cost from revenues and a capability to contribute to debt service costs.</p> <p>As a result, the project may be expected to meet or exceed the forecast financial return set out in the feasibility study.</p> <p>JC Rating - N/A as project has not yet been built. - Potentially satisfactory – there has been a major improvement in the financial performance and condition as a result of higher tariffs, improved billings and other operating efficiencies.</p>	
JC 8.3 Level of improvements in ESG achievement	
<p>ESG risks in Saidabad were assessed in the ESIA as relatively low provided there is appropriate environmental monitoring. The most significant risk is the quality of raw water at its river source 30km from the WTP where there should be vigilance to ensure that it is not polluted or contaminated.</p> <p>According to an ADB 2018 case study, DWASA had introduced a ‘Gender Equity Strategy’ which brought about governance reform to mainstream gender; and training to be more responsive to gender needs in their service.</p>	

²² This included dividing Dhaka into 145 district metered areas (DMAs) that could be more easily managed with closer contact with local communities.

²³ http://www.globalwaterleaders.org/the_award/results/2013

JC Rating – N/A as project has not yet been built. - Potentially satisfactory – - ESG risks in Saidabad were assessed in the ESIA as relatively low provided there is appropriate environmental monitoring.
EQ 8 Overall Rating N/A as project has not yet been built. - Potentially satisfactory – Project implementation is expected to begin later this year. The turnaround in DWASA's economic, social, environmental and financial performance coupled with an in-depth feasibility study and due diligence raise the likelihood that Saidabad will be economically, socially and environmentally sustainable.

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
JC 10.1 Quality of risk management systems and policies on long-term sustainability	
<p>The May 2017 project document identified the following major risks:</p> <ul style="list-style-type: none"> Limited operations and maintenance (O&M) capacity of DWASA - Handling highly automated technology in Saidabad III WTP (as well as the other new mega WTPs) might require a new culture of work that might be too difficult for DWASA to adopt. WTP complementary infrastructure not in place - water Intake and water transmission pipes and distribution mains are not completed on time. DWASA failure to sustain momentum of utility turnaround. This could happen if senior management is changed or because of political interference. DWASA failure to maintain good operational and financial results – As a result of internal pressures from its union, good operational results could be reverse; as a consequence, costs can escalate and financial results could suffer. Uncontrolled urban development could result in an environmental degradation of raw water at the chosen Meghna river intake. <p>Key risks and mitigation measures of the project include:</p> <ul style="list-style-type: none"> As with phase II, DSIF will appoint a consultant to oversee implementation. An additional environmental review of the Meghna river intake and surrounding area in 2017 to address the pollution risk to raw water quality stressed the need for vigilance to ensure that remedial measures are taken as early as possible. <p>ADB reviews in 2017 and 2018 of the turnaround at DWASA in all key areas of its operations and financial position was bullish on this continuing. It noted that an 'effective capacity building program' had been implemented. This included a five-year corporate business plan; human resource development; and financial management improvements.</p> <p>The field visit did not find that any significant risks that had not been identified.</p> <p>JC Rating -  Satisfactory. Institutionally DWASA appears to be capable of implementing phase III as effectively as phase II was. The key risk, as with phase II, is the limited control DWASA has over the quality of the river sourced raw water for the WTP.</p>	
JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>Although the project has yet to be implemented appropriate M&E systems to track and manage outputs are likely to be put in place. This confidence is based on:</p> <ul style="list-style-type: none"> Use of DSIF design and implementation consultant. Enhanced capacity of DWASA to manage its operations, including investments in its infrastructure and systems. The selected indicators are appropriate. <p>Tracking development outcomes, however, is likely to be less effective with only general indicators having been specified. The focus of DSIF tracking is on project completion and implementation and not development outcomes.</p> <p>JC Rating –  - Partly satisfactory – While outputs will be well tracked and monitored this is not likely to be the case for development outcomes, with only general indicators having been specified. The focus of DSIF tracking is on project completion and implementation and not development outcomes.</p>	
EQ 10 Overall Rating –  - Partly satisfactory While risks have been well identified, there is insufficient attention to tracking development outcomes, the focus instead being on project implementation.	


EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
The output indicators set out in the May 2017 project document are appropriate: Saidabad III WTP + Sludge Treatment Plant]	

Baseline 2017	Saidabad I+II, 450.000 m3/day
Target 2019	Saidabad III + Sludge TP detailed design completed
Target 2019	Construction starts
Target 2021	Saidabad III 450.000 m3/day
Target 2025	Operations of works transferred to DWASA

The development outcome indicators are set out below. They cover access to good quality surface water and reductions in poverty:

Access to Piped Potable water		Poverty levels	
Baseline 2016	3,7 m	<i>Head count poverty</i>	
Target 2021	7,0 m	Baseline 2015:	24,8%
<i>Of which Low Income Population</i>		Target 2020:	18,6%
Baseline 2016	0,3 m	<i>Access to water</i>	
Target 2021	1,4 m	Baseline 2015:	86%
		Target 2021:	99%


While in generically reasonable they are cannot directly be attributed to the project, especially the poverty reduction indicators

JC Rating –  - Party satisfactory While output indicators are appropriate, insufficient attention has been given to defining outcome indicators that track the effectiveness of the project.

JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

As the project has not started it is not possible to comment.

JC Rating – N/A

EQ 11 Overall Rating –  - Party satisfactory - While output indicators are appropriate, insufficient attention has been given to defining outcome indicators that track the effectiveness of the project.

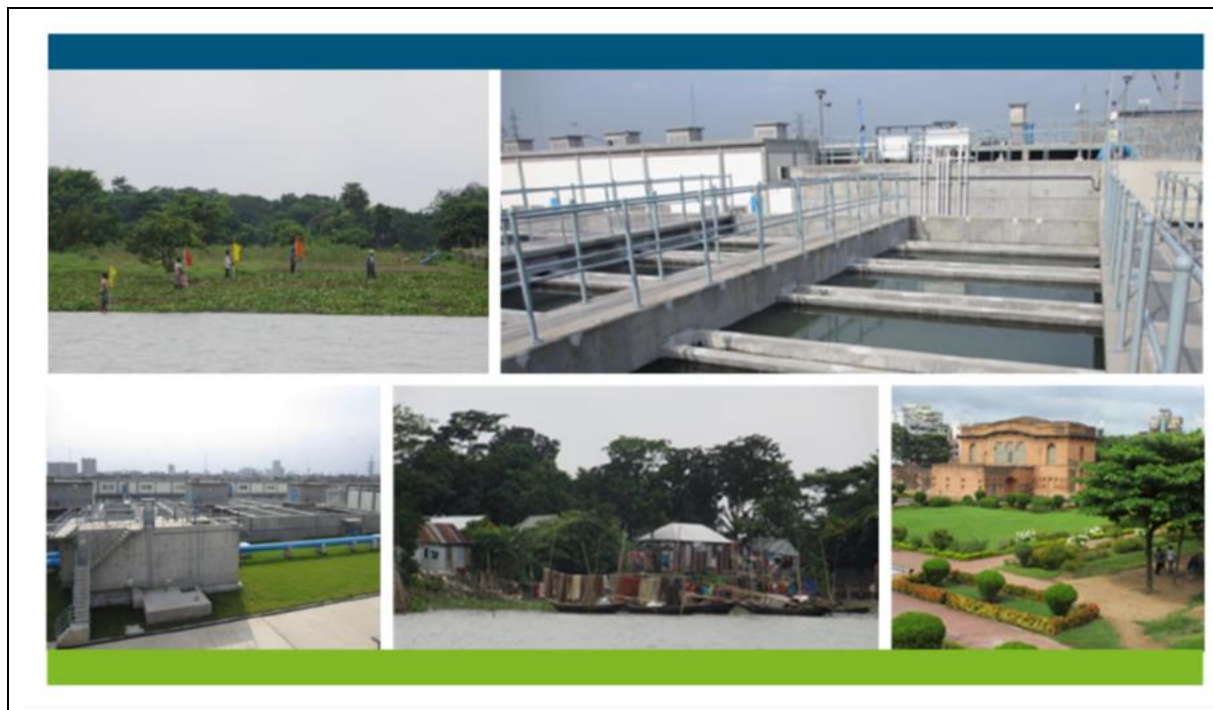
Field visits and calls



Component 1 Meghna River Inlet



Field Visit Saidabad III Site – adjacent to phases I and II



Planned Water Treatment Plant

2.1.1 DWASA Zoom Call 24 April 2021

DWASA:

- Mustafizur Rahaman Kamal PMU 5 years since 2009
- Md. Nurujjaman, Executive Engineer, SWTPPP-III, DWASA.
- Quaran Naher Laily
- Sultana Raiz PD Saidabad III since 1993 with DWASA
- Mustafa Kamal

Particip:

- Avijit Podar
- Andrew Danino

Phase II where operations started in 2012:

- was well implemented
- is state of the art in design
- is working well
- uses mainly European equipment including Danish Grundfos pumps that are very good.

Phase III was given the go ahead in 2012 with funding for the feasibility study provided by French government TA facility FACIT. It was approved in December 2015 TA. Selection of a project manager for Component 1 (treatment at raw water source on Meghna river and pipeline to Saidabad. Included the scope of work is a master plan for Meghna river.

DSIF will appoint its own design consultant for Component 2 – Saidabad III WTP.

Dhaka is divided into 150 districts for WatSan planning purposes. The current goal is for 50% of Dhaka population to have access to WatSan in 3 phases. At present only 20% of Dhaka's population is connected to sewerage services.

Consideration is being given to '**progressive water tariffs**'.

2.1.1.1 Working with DSIF:

1. Why was DSIF approached for S II support/finance? – There is a good relationship with Danida and the embassy which dates back to 2006 and it easy to work with.
2. For S III embassy proposed \$100m of support
3. DWASA also works with ADB for sewerage projects
4. How well did DSIF respond to approach/request? - no complaints about professionalism, speed of response and technical competence of DSIF
5. How important was Danish equipment / contractors / technical assistance in decision to approach DSIF? - Most of the equipment used came from European suppliers
6. How important was the financing package (including subsidies) in decision to approach DSIF on S III? The subsidy was good but the tenor of the loan was too short at 15 years compared with soft loans from AFD (25 years) and KfW (38 years)
7. Quality and speed of DSIF appraisal - Local context sometimes not well understood by DSIF, including issues of unplanned development and cleaning up the leather industry

2.1.2 Saidabad III - Skype Interview KfW 15 June 2021

Fatema Rosalynn Khan 4 years with KfW during which time she has been involved in project

- There is no specific cooperation with DSIF because they are funding different components. Component 1 - KfW (€90m) along with AFD and EIB are funding the raw water supply which has to be in place before Saidabad III can start operations.
- A key issue on Component 1 is third party protection at the Meghna River source. There is a master plan for the river to manage development around it. Rapid industrialisation near proposed source.
- 30 km route to Saidabad to be finalised. Goes through densely populated parts of Dhaka and will cross major roads.
- 2 resettlement plans have been done with 1 more to be undertaken.
- The project is being overseen by 2 ministries: Econ relations MoF – high level at MoLG (Mr Ibrahim) that will oversee technical implementation
- Min LG appointed DWASA MD (4th term 11 years)
- There is a high-level committee overseeing project that has representatives from 11 Ministries
- A project management consultant (PMC) is being appointed soon
- There will be at least 2 transmission pipes.
- 2023 is the earliest that the project will be completed assuming design and consultation work finished by early 2022.

There is an expansion of the distribution network that is underway to benefit up to 9m

In Bangladesh KfW supports energy, smart grids, textile related projects and drinking water projects outside Dhaka,

2.1.3 Field Visit Report 1: DWASA Saidabad Project, Dhaka

Date of field work	17 & 21 June 2021 (two days)
Date of submission	23 June 2021

Officials to whom I met:

1. Engr. Quamrun Nahar Laily, SE & PD, SWTPP, Phase-III, DWASA

2. Engr. Wahidul Islam Murad, SE, SWTP, DWASA
3. Engr. Mostafizur Rahman, XEN, DWASA
4. Engr. Md. Nuruzzaman, XEN, DWASA
5. Engr. Masud Hossain, SAE, DWASA (accompanied me in the field)
6. Kazi Maruful Haque, Manager, QHS&E, SWTP (accompanied me in the field)
7. Mohammed Mobarak Hussain, Manager, OP&L, SWTP.

2.1.3.1 DWASA Project: Saidabad Water Treatment Plant Project, Phase-III

Project –III: Basic Information

1	Implementation Period	:	July 2015 to June 2021
2	Time extension proposed up to	:	June 2025
3	Major reasons for time extension	:	<ul style="list-style-type: none"> • Complicacy pertaining to securing adequate funding from the Development Partners; • Writ petition against land acquisition; and • Concern of the development partners due to the ongoing industrial activities on the bank of the Meghna River and subsequent pollution of river water.
4	Consulting Firm selection status	:	PMC (Wait for CCGP Approval) DSC (Contract Negotiation on going)
5	Land acquisition	:	Completed 32,277 Acre under Narayanganj and 2,03 Acre under Dhaka.

Information on Intake and Transmission line:

1	Location of Intake	:	Village –Haria, Union –Baidder Bazar Upazila –Sonargaon, District –Narayangan.
2	Area for Intake station	:	10 Acres (Approx.)
3	Present status	:	Open land
4	Water Source	:	Meghna river
5	River condition	:	Big river with current
6	Transmission line	:	26 Km

The key finding from the visit is that the treatment plan is reliable. DWASA pays attention to proper operation and maintenance so that it serves the people of Dhaka City.

2.1.4 Field Visit Report 2: Water Supply for LIC (Low Income Community) - Dhaka City Corporation

Date of field work	22 June 2021
Date of submission	23 June 2021



2.1.4.1 Overall Findings:

- The poor communities are pleased with DWASA to have a water supply connection but at time of field visit it was not working. The DWASA Engineer reported that other LIC areas are being supplied normally.
- Some projects are in progress of implementation under DWASA with view to improve the access to drinking water and sewerage services.
- The provision of potable water and sewerage are obviously reasonable and affordable for the LIC (low-income committee) as provided by earlier projects.

2.1.4.2 Basic Information:

1	Project /Program	:	Development of Dhaka WASA Activities in LIC localities including Capacity Building and Financial Modelling Under the framework of Saidabad Phase-III Project.
2	Source of Fund	:	AFD
3	Implementation Period	:	May 2016 to June 2020.
4	Major Activities	:	1) Water Connection 2) Financial Model 3) Training Capacity.
5	Partner NGOs	:	1) DSK 2) BASA 3) SPACE 4) Water & Life Bangladesh.

2.1.4.3 NGO-wise Activity: Information A (Lot-1)

A.1	NGO Name	:	DUSHTHA SHASTHYA KENDRA (DSK) as Lead Partner NAGORIK SHEBA FOUNDATION (NSF) - NAGAR DARIDRA BOSTIBASI UNNAYAN SHNGSTHA (NDBUS) as associate partners. House # 741, Road # 09, Baitul Aman Housing Society, Adabar, Dhaka-1207.
A.2	NGO Contact Person	:	Name: Akhil Chandra Contact No. 01730-023523 Email: dskpehupdhaka@gmail.com
A.3	Contract Value Actual Expenditure	: : :	BDT = 39.765.374,00 BDT = 36.058.957,00
A.4	Working area	:	Mirpur-12
A.5	Period of Activity	:	19/12/2017 to 30/09/2018
A.6	Population coverage for service	:	18.990 People
A.7	Major Works	:	Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

2.1.4.4 NGO-wise Activity: Information B (Lot-2)

B.1	NGO Name	:	DUSHTHA SHASTHYA KENDRA (DSK) as Lead Partner Bangladesh Association for Social Advancement (BASA) & Initiative for People's Development (IPD) as associate partners. House # 741, Road # 09, Baitul Aman Housing Society, Adabar, Dhaka-1207.
B.2	NGO Contact Person	:	Name: Akhil Chandra Contact No. 01730-023523 Email: dskpehupdhaka@gmail.com

B.3	Contract Value Actual Expenditure	∴ ∴	BDT= 28.473.317,00 BDT= 25.608.617,00
B.4	Working area	:	Mirpur-2 (Muktijodha Complex)
B.5	Period of Activity	:	19/12/2017 to 30/09/2018.
B.6	Population coverage for service	:	13.500 People
B.7	Major Works	:	Water connection (i) CSP (complex standpoint) -hanging (ii) SSP (simple standpoint)

2.1.4.5 NGO-wise Activity: Information C (Lot-3)

C.1	NGO Name	:	Bangladesh Association for Social Advancement (BASA) as Lead Partner and Central Gonounnyan Sangstha (CGS) & Initiatives for People's Development (IPD) JV. House # 113, Road # 06, New DOHS, Mahakhali, Dhaka-1206.
C.2	NGO Contact Person	:	Name: Milton Mia Contact No.01711329640 (Saiful) Email: miltonbasa@gmail.com
C.3	Contract Value Actual Expenditure	∴ ∴ ∴	BDT = 32.773.476,00 BDT = 30.531.392,00
C.4	Working area	:	Mirpur-11 (Bihari Comp)
C.5	Period of Activity	:	19/12/2017 to 30/09/2018.
C.6	Population coverage for service	:	11.952 People
C.7	Major Works	:	Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

2.1.4.6 NGO-wise Activity: Information D (Lot-4)

D.1	NGO Name	:	DUSHTHA SHASTHYA KENDRA (DSK) House # 741, Road # 09, Baitul Aman Housing Society, Adabar, Dhaka-1207.
D.2	NGO Contact Person	:	Name: Akhil Chandra Contact No. 01730-023523 Email: dskpehupdhaka@gmail.com
D.3	Contract Value Actual Expenditure	∴ ∴ ∴	BDT= 47.780.678,00 BDT= 43.599.730,00
D.4	Working area	:	Mohakhali
D.5	Period of Activity	:	19/12/2017 to 30/09/2018.
D.6	Population coverage for service	:	26.622 People
D.7	Major Works	:	Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

2.1.4.7 NGO-wise Activity: Information E (Lot-6)

E.1	NGO Name	:	Society for People's Action in Change and Equity (SPACE)- Shobujer Ovijan Foundation (SOF)- M/S Kabir Enterprise (KE) JV House # 695/A, Road # 11, Baitul Aman Housing Society, Adabar, Dhaka-1207.
E.2	NGO Contact Person	:	Name: Md. Monzu Contact No.01798-033916

		Email: mollahtradecom@gmail.com
E.3	Contract Value Actual Expenditure	. BDT = 29.071.860,00 : BDT = 28.890.686,00 :
E.4	Working area	: Mohakhali
E.5	Period of Activity	: 19/12/2017 to 30/09/2018.
E.6	Population coverage for service	: 12.692 People
E.7	Major Works	. Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

2.1.4.8 NGO-wise Activity: Information F (Lot-7)

F.1	NGO Name	: Bangladesh Association for Social Advancement (BASA) House # 113, Road # 06, New DOHS, Mahakhali, Dhaka-1206.
F.2	NGO Contact Person	Name: Milton Mia Contact No.01711329640 (Saiful) Email: miltonbasa@gmail.com
F.3	Contract Value Actual Expenditure	. BDT = 34.532.454,00 : BDT = 16.088.552,00 :
F.4	Working area	: Mirpur-11 (Bihari Camp)
F.5	Period of Activity	: 19/12/2017 to 31/12/2018.
F.6	Population coverage for service	: 5.166 People
F.7	Major Works	. Water connection (i) CSP (complex standpoint) (ii) SSP (simple standpoint)

2.1.4.9 NGO-wise Activity: Information G (Lot-8)

G.1	NGO Name	: Water and Life Bangladesh (W&L) JV Partner Shobar Jonno Pani Ltd (SJP) Jannat Monjil (First Floor), 126/1-B, Senpara Porbota, Ward No. 14, Mirpur-10, Dhaka-1216.
G.2	NGO Contact Person	Name: Md. Sumon Ahmed Contact No. 01815-849369 Email: abul-hossain.summon@waterandlife.ngo
G.3	Contract Value Actual Expenditure	. BDT = 29.066.750,00 : BDT = 18.531.900,00 :
G.4	Working area	: Mirpur-14 (Vashantek)
G.5	Period of Activity	: 19/12/2017 to 30/04/2020.
G.6	Population coverage for service	: 9.060 People
G.7	Major Works	: ½" diameter piped Water connection

2.1.4.10 Field visit information: (visited on 22 June 2021)

1.	Location	: Begam Tila Slum and Raju Basti at East Kurmitala, Ward No. 02, Dhaka North City Corporation, Dhaka
2.	Whom I met and discussed in the slum.	: (i) Nayan, DSK (NGO) Representative. (ii) Afroza, DSK (NGO) accompanied me in the field. Water Connection Customer: (i)Mamotaj, (ii) Malek, (iii) Masum Mia, (iv) Amena.

3.	Observations with information	: A few (3 to 7 family) use the water connection. Multiple connections are made with their own arrangement to get water from each house. Somewhere connection is made in the toilet due to lake of land-space. Supply water is not adequate at present; many customers get water at night only, some customers do not get water at all. some customers do not pay due to getting no water.
4.	Attachment	: Photos of activities and slum.

3 Bangladesh: Upgrading of Hazrat Shahjalal International Airport

Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> • DSIF funded feasibility study • Scope was reduced to taxiways and related lighting. • DSIF was not additional as project could have been funded by CAAB which was profitable and had resources • Eight-year delay between approval and implementation • Satisfactory implementation by Munck, good quality of work • Airport traffic volumes growing pre Covid 	

Summary																							
Project name	Upgrading of Hazrat Shahjalal International Airport																						
Type of project	Airport																						
Project No.	104.O.30.Bangladesh																						
Description	<p>The project involved upgrading Hazrat Shahjalal International²⁴ (HSI) airport in Dhaka, the principal airport in Bangladesh, with rehabilitation of taxi ways and aprons, as well as training facilities and replacing obsolete radar, navigation and communication equipment. HIS is managed by the Civil Aviation Authority of Bangladesh (CAAB) that is part of the Ministry of Civil Aviation and Tourism. The development of the project is to contribute to the economic development of the country by improving the country's infrastructure and the efficiency of air traffic, as well as ensuring that national standards for aircraft safety are met. Specifically, the project includes an upgrade of the existing international airport in Dhaka, with rehabilitation of taxi ways and aprons, as well as drainage facilities and various radar, navigation and communication equipment.</p> <p>2003 Appraisal Report - Project Costs²⁵</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Cost US\$m</th> </tr> </thead> <tbody> <tr> <td>Taxiways</td> <td>19,3</td> </tr> <tr> <td>Apron extension</td> <td>7,9</td> </tr> <tr> <td>Drainage</td> <td>3,3</td> </tr> <tr> <td>Maintenance equipment</td> <td>0,3</td> </tr> <tr> <td>Visual guidance – signs...</td> <td>1,6</td> </tr> <tr> <td>Radar</td> <td>8,9</td> </tr> <tr> <td>Navigation aids</td> <td>1,5</td> </tr> <tr> <td>Radio communications</td> <td>1,3</td> </tr> <tr> <td>Uncertainty provisions</td> <td>7,1</td> </tr> <tr> <td>Total</td> <td>51,2</td> </tr> </tbody> </table> <p>Hazrat Shahjalal International Airport is the principal international access to Bangladesh. In 2002 there were approximately 28.500 civilian landings/departures (ATM), about half of which were international. In total, almost three million passengers used the airport in 2002, of which about 85% were international. The total cost of technical assistance including feasibility studies, audit of master plan, EIA, preparation of design and tender documents, supervision and a monitoring consultant amounts to approximately DKK 23 million and is financed on a gift basis under the grant.</p> <p>There was a long period of more than eight years between approval in March 2004 and signing of the loan agreement at the end of 2012</p>	Category	Cost US\$m	Taxiways	19,3	Apron extension	7,9	Drainage	3,3	Maintenance equipment	0,3	Visual guidance – signs...	1,6	Radar	8,9	Navigation aids	1,5	Radio communications	1,3	Uncertainty provisions	7,1	Total	51,2
Category	Cost US\$m																						
Taxiways	19,3																						
Apron extension	7,9																						
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Maintenance equipment	0,3																						
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Radar	8,9																						
Navigation aids	1,5																						
Radio communications	1,3																						
Uncertainty provisions	7,1																						
Total	51,2																						
Sector	Transport																						

²⁴ Also known as Zia International Airport

²⁵ 2003 Appraisal Report - Table E **Fejl! Kun hoveddokument.** P

Summary					
Country	Bangladesh				
Sponsor	Civil Aviation Authority of Bangladesh (CAAB)				
Other stakeholders	Ministry of Civil Aviation & Tourism, Bangladesh				
Clearance in principle	Document not available				
Approval/Binding Commitment	29 March 2004	Loan Agreement	6.12.2012 Amendment March 2014		
Danish Bank	Nordea Bank				
Loan Duration + Grace Period	Starting point 31 10 2014 over 10 years				
Project Amount and funding plan	DKK 311m Amendment March 2014 + DKK 25m = total DKK 336m				
Danish Exporter	Munck Asfalt A/S (MA) the Danish main contractor				
EKF guarantee	Date	Amount	Duration		
Implementation status	Completed July 2014				
Feasibility study details	CAAB - Feasibility Study - Upgrading Works of Zia International Airport, Dhaka, Bangladesh October 2002				
Subsidy – rationale and key features	(DKK/USD 6,06)		DKKm		
	Total		200		
	Interest subsidy (59		
	EKF prize		28		
	Bank margin		2		
	Extra cash gift amount		70		
	Technical assistance, etc.		23		
	Budget margin 10%		18		
Country Context	<p>At appraisal Bangladesh was a low-income country that is eligible for DSIF (mixed credits) support. At the time of the project, it had a population of about 150 million and was one of the world's poorest, most densely populated, and least developed nations. Dhaka with a then population of 15 million that was rapidly growing. It is the political and commercial capital of Bangladesh and its airport is the principal gateway to the country. The low location of the airport, lack of efficient drainage and extensive and return flooding during the rainy season have contributed to the gradual degradation of the pavement. The coating is in such a damaged condition that the cracks in the coating is loosened and mud rises up and settles on the surface. Overall, the condition of the coating is thus critical and poses a risk to aircraft safety.</p> <p>Even more important, the airport's radar, communication and navigation systems and equipment were obsolete and did not meet standards set by the International Civil Aviation Organization. Moreover, they were a safety risk. The equipment cannot be maintained anymore and a breakdown is imminent with the following downgrading of the airport. In addition, the system is considered to be insufficient for effective monitoring and recording of overflights of the Bangla airspace, which means that the CAAB's revenue base is not used. Although these elements were in appraisal report they were subsequently dropped as the budget was insufficient.</p>				

Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	


Bangladesh-Denmark Partnership(BDP) - Strategy For Development Cooperation 2005-2009, This states, inter alia, that 'Efforts are being made to pursue Mixed Credits initiatives in areas such as airport facilities, physical infrastructure, electrical transmission lines, large scale urban water supply etc.' At the time that HSIA was approved, one Mixed Credits (DSIF) project had been implemented in Bangladesh.

Efforts are being made to pursue Mixed Credits initiatives in areas such as airport facilities, physical infrastructure, electrical transmission lines, large scale urban water supply etc.

The BDP sets out four areas in the Cooperation Programme 2005-2009

- 4.1 Agricultural Sector Support
- 4.2 Water Supply And Sanitation Sector Support
- 4.3 Human Rights, Democratisation and Good Governance
- 4.4 Chittagong Hill Tracts

It is evident that the airport was not a strategic area for support. This project therefore appears to have been an ad hoc initiative as DSIF tried to expand its portfolio in Bangladesh.


JC Rating -  Partly satisfactory – While the upgrade and rehabilitation of by far the busiest airport in Bangladesh was developmentally important, it was not in one of the four priority sectors for Danish cooperation, although it meets Danida and DSIF eligibility criteria.

JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account

Two important documents issued in 2003 make no reference to the need to upgrade the airport:


- The infrastructure chapter (annex 6) of the 2003 National Strategy for Economic Growth, Poverty reduction and Social Development makes no reference to airports while covering roads, power, natural gas, rural infrastructure, ports and telecoms.
- World Bank Bangladesh Public Expenditure Review May 25, 2003

According to DSIF selection criteria, projects should be based on local demand and needs. This is achieved by requiring that projects are reflected in national development strategy and sector plans. Although the upgrade of HSIA to meet international airport and air traffic control standards is developmentally important so as to ensure the growth of air traffic, there is no mention of the project. It does not appear to meet this criterion. However, the owner of HSIA is the Civil Aviation Authority of Bangladesh (CAAB) which reports to the Ministry of Civil Aviation & Tourism. There would seem to be implicit GoB backing for this project.

JC Rating -  Partly satisfactory – HSIA upgrade is not included in 2003 national Strategy for Economic Growth, Poverty reduction and Social Development. Implicit GoB support for project comes from the fact that it is a state-owned enterprise under the Ministry of Civil Aviation & Tourism.

JC 1.3 Added value of Project Preparation Facility (PPF)

According to the appraisal report, DKK 23 m was provided by earlier PPF for the October 2002 feasibility study although there is no information of who actually prepared it. No documentation was available on the appropriateness of using the original PPF for a project that did not fit well with the country strategy. Field visit meeting with CAAB confirmed that high quality FS was prepared.

JC Rating -  Partly satisfactory – CAAB satisfied with feasibility study

JC 1.4 Complementarity with development partners operations and strategies


The Japanese agency JICA was also invited to submit a proposal to fund the project. DSIF was selected as it had the highest grant/subsidy element


This is a stand-alone DSIF project, no other development partners were involved. In 2004 no other DPs appear to have been involved in supporting airports in Bangladesh.

JC Rating -  Partly satisfactory

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts





According to the 2002 feasibility study²⁶: 'The proposed project is an ad-on activity to a going concern. The budget for the total proposed project activities is about 25 mill USD. This investment size is within a range, which CAAB is fully able to absorb out of its net profits from on-going operations, as shown below.' While upgrading and modernising the airport to ensure that growth in international flights and passengers visiting Bangladesh continues, and is developmentally beneficial, there was not a need for concessional financing from DSIF to support the project. The FS concludes that 'Without DSIF the project would most probably have gone ahead without DSIF.' The DSIF funding allocated to HSIA could have been better used in projects that required DSIF support to be implemented.


JC Rating -  Partly satisfactory – While the HSIA upgrade was necessary and developmentally beneficial, it would have gone ahead without DSIF as the company was able to fund the investment programme from its own financial resources.

EQ 1 Overall Rating –  Partly satisfactory. The project was not included in either the Denmark Bangladesh cooperation strategy or the 2003 National Strategy for Economic Growth, Poverty reduction and



²⁶ Section 2 page 12



Social Development. DSIF's primary relevance was through the provision of an extensive programme of TA starting with funding the feasibility study to providing consultants for design
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EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p>HSIA is coherent, inter alia, with the following MFA policies for DSIF projects:</p> <ul style="list-style-type: none"> • The project meets Danida's overall objective of poverty reduction, providing the basis for economic growth through the improvement and efficiency of infrastructure and increased aviation safety. • Bangladesh GNI per capita below USD 3,895 (2019) • At DKK 336m the project was well over the minimum size of DKK 100m million. • Conformed with ESG and sustainability criteria. <p>Airport infrastructure does not, however, fall under one of the four cooperation areas set out in the 2005 2009 Denmark Bangladesh cooperation strategy (although the document does acknowledge that is taking place). Also, the 2003 National Strategy for Economic Growth, Poverty reduction and Social Development does not refer to investment in airports.</p> <p>C Rating -  Partly satisfactory – while project meets several eligibility criteria, it fell outside the Denmark Bangladesh cooperation areas and was not included in Bangladesh's 2003 National Strategy for Economic Growth.</p>	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p>There was no coherency with other Danish development initiatives in Bangladesh as the project did not fit with any of the four areas in the Cooperation Programme</p> <p>JC Rating -  Unsatisfactory – No synergies or complementarity with other Danish development initiatives in Bangladesh</p>	
JC 2.3 Danish business links with beneficiary countries	
<p>Fejl! Henvisningskilde ikke fundet. in the appraisal report (AR) shows that 66%-67% of the project can be sourced from Denmark, well comfortably above the 50% minimum, most of the key high value-added radar equipment would not be sourced from Denmark. Excluding such equipment, the project is primarily civil engineering (repairing taxiways and aprons and replacing lighting and signs etc) where it is unclear whether Danish contractors had an advantage and may have been more expensive than firms in Bangladesh or the region. According to its website of the selected Danish contractor, 'Munck Asphalt & Civil Engineering is an experienced, trustworthy partner within asphalt production, paving and road construction.'²⁷. There is no mention of a capability in airport projects.</p> <p>JC Rating -  Partly satisfactory – there was to be limited sourcing of the radar equipment required to modernise the air traffic control system (which were subsequently dropped from the project). Instead, Danish companies would be limited to relatively low to middle value civil engineering.</p>	
EQ 2 Overall Rating -  Partly satisfactory - HSIA did not fit in well with the cooperation strategy in Bangladesh. It met most of the DSIF project eligibility criteria.	


EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>As noted in the AR Without DSIF the project would most probably have gone ahead without DSIF. HSIA is a profitable state owned enterprise that could cover the cost of the project from the profits of less than two years operations. The DSIF funding allocated to HSIA could have been better used in projects that would not have gone ahead without DSIF support.</p> <p>For HSIA the high level of concessionality and grants made it attractive to use DSIF funding enabling it to allocate its resources to other purposes. JICA was also approached but DSIF package more attractive.</p> <p>JC Rating -  Unsatisfactory – no financial additionality. As stated in the AR the project would most probably have gone ahead without DSIF.</p>	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
<p>The total cost of technical assistance, provided as a grant, including feasibility studies, audit of master plan, EIA, preparation of design and tender documents, supervision and a monitoring consultant amounts to approximately DKK 23 million and is financed on a gift.</p>	

²⁷ <https://www.munck-asfalt.dk/72-home.html>

JC Rating -  Satisfactory – An extensive programme of TA ranging from funding the feasibility study to providing design, monitoring and verification consultants provided high non-financial value added.
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding
No mobilisation of commercial and development bank funding JC Rating - Not applicable.
EQ 5 Overall Rating –  Partly satisfactory – No financial additionality as the project would have gone ahead without DSIF support. Good non-financial additionality through a TA programme which included funding the feasibility study to providing design, monitoring and verification consultants.


EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
<p>The contract with Munck Asphalt was signed in July 2012 and work began in January 2013 and were completed by 8 July 2014 three months ahead of time (where the last take-over of completed works took place). The final debriefing note on the implementation of the upgrading of HSIA was issued in July 2015 by Gromij the verification consultant appointed by DSIF. This confirmed that Munck had satisfactorily carried out all the contractual work required and that there were no outstanding defects or issues. The work carried out comprised:</p> <ul style="list-style-type: none"> • Rehabilitation of the four taxiways (H, S, N and C), including drainage works • Aircraft ground lights for all four taxiways <p>Although the scope of work in the AR includes rehabilitation and modernisation of the air traffic control systems, the budget was insufficient and these components were dropped.</p> <p>Due to Covid restrictions it was not possible to visit the airport. The field visit meeting with CAAB and an interview with the verification consultant, however, confirmed that there had been satisfactory implementation. Moreover, CAAB confirmed that since the completion the taxiways have been functioning at full capacity and no maintenance work has been necessary to date.</p> <p>JC Rating –  Satisfactory</p>	
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
<p>The AR and project document set the following outcome indicators:</p> <ul style="list-style-type: none"> • Capacity utilization of the airport (actual flights, passengers and cargo compared to assessed capacity). • Days over the year for which the airport and the equipment are available (compared to expected availability). <p>Although described as outcome indicators, they in fact relate to outputs. The entire monitoring and verification approach is centred on outputs. Moreover, the choice of indicators is generic and limited. Did strengthened taxiways and aprons, for example, meet the required standards to allow for large heavy passenger and cargo planes to use them? The benefits and development outcomes that should flow from having Dhaka airport meet international standards are not articulated and indicators to measure such outcomes have not been formulated.</p> <p>The field visit meeting with CAAB found that the technical capacity of Dhaka Shah Jalal International Airport increased, which in turn is contributing to the national economic development as well as facilitating attaining higher GDP growth. The airport now can handle the increased passenger as well as cargo flow. It can cope with need of the day i.e., higher number of flight incoming and outgoing flights.</p> <p>JC Rating -  Partly satisfactory – Only generic output indicators were set. No outcome indicators and target were articulated. Monitoring and verification reports do not analyse the project implementation in detail.</p>	
JC 6.3 Environmental, social and governance (ESG) risk management	
<p>In the feasibility study it is stated: ‘The proposed project is an upgrading of existing facilities. Therefore, the majority of the elements of the project will constitute an environmental improvement compared with the situation today, but the main improvements lie in air traffic security and safety and general handling of some environmental aspects. ...The most relevant problems of environmental impact should be registered during the construction phase. For this reason, special emphasis should be placed on the project construction period.’ The environmental risks were judged as minor and not difficult to manage . They can be summarised as:</p> <p>During implementation:</p> <ul style="list-style-type: none"> • impact of construction works (location and operation of asphalt and concrete plants, transport of materials etc); • disposal of concrete waste; • removal of trees in ILS zone; • safety and efficiency of airport operation; • well-being of construction workers. <p>During operation:</p>	

<ul style="list-style-type: none"> undesirable access through perimeter areas; safety and efficiency of operating new equipment; control of potential contaminants into airport drainage system. <p>Under the Environmental Conservation Rules 1997 set by Ministry of Environment and Forest projects are rated in one of four categories (Green, Amber A, Amber B and Red), in ascending order of the number and severity of negative environmental impacts. The upgrading of Hazrat Shahjalal International Airport was rated Amber B, requiring the submission of an initial environmental examination (IEE) and an environmental management plan (EMP) to obtain clearance from the DoE. A 'no objection certificate' (NOC) from the CAAB/concerned ministry and the project feasibility study report will have to be attached with the application to the DoE.</p> <p>There is no information in the project either in monitoring and verification or handover reports on environmental compliance.</p> <p>JC Rating -  Partly satisfactory – there is a lack of information on environmental compliance in monitoring and verification or handover reports. It is, however, unlikely that there will have been adverse environmental effects given the upgrade and modernisation nature of the project. Instead, an environmental improvement was anticipated, especially in terms of better air traffic security and safety.</p>
<p>JC 6.4 Contribution to climate change mitigation, green and inclusive development</p>
<p>This aspect not specifically addressed as project appraised in 2004. Nevertheless, enhancements to areas such as wastewater run-off etc would be positive albeit in a minor way.</p> <p>Account not taken of increasing passenger numbers, cargo volumes and aircraft movements at airport volumes going</p> <p>JC Rating -  Satisfactory – Minor contributions to CC mitigation as would be expected in a project of this nature.</p>
<p>JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth</p>
<p>JC Rating -  Satisfactory - Project predates HP. Nevertheless, in general project not in conflict with HP.</p>
<p>EQ 6 Overall Rating -  Partly satisfactory – Project was well implemented ahead of schedule. There was though poor articulation of indicators which are generic, both on outputs and especially on outcomes. There is a lack of detailed information in monitoring and verification and handover reports on the actual implementation of the upgrading programme. While no information on environmental effectiveness, the risks were modest and limited.</p>

<p>EQ 7 Commercial /developmental balance</p>	<p>Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?</p>
<p>JC 7.1 Satisfactory development outcomes(using DAC definition of impact)</p>	<p>The AR and project document did not include DAC compliant development outcome indicators²⁸. Moreover, there is a lack of detailed information in monitoring and verification and handover reports on the actual implementation of the upgrading programme. The reports simply state that the project was completed in 21 months, three months earlier than planned; the work undertaken was judged to be to a satisfactory standard so that the project could be handed over to the client.</p> <p>The field visit meeting with CAAB found that the technical capacity of Dhaka Shah Jalal International Airport increased, which in turn is contributing to the national economic development as well as facilitating attaining higher GDP growth. The airport can now handle the increased passenger as well as cargo flow. It can cope with need of the day i.e., higher number of flight incoming and outgoing flights.</p> <p>JC Rating -  Partly satisfactory – Although no outcome reporting, CAAB confirmed to Particip that taxiways were well constructed and have enabled increasing traffic at airport.</p>
<p>JC 7.2 Strong ESG performance of DSIF projects</p>	<p>ESG performance was expected at best to be modestly positive - given that as stated in the appraisal documents that HSIA is an upgrading of existing facilities., and that ...the majority of the elements of the project will constitute an environmental improvement compared with the situation today, but the main improvements lie in air traffic security and safety and general handling of some environmental aspect.</p>

²⁸ The two outcome indicators listed (capacity utilisation) and days in service of airport are in fact output indicators.

There is no information in debriefing notes on implementation and hand over on ESG performance. It is likely, however, that had there been ESG problems and issues that they would have been raised. It is implicit in the handover of the project that there were no ESG issues of note.

JC Rating -  Partly satisfactory – There is a lack of any monitoring information on ESG performance. Appraisal documents, however, judged this airport upgrade as being overall ESG positive.

JC 7.3 Satisfactory financial returns and portfolio performance


The 2002 Feasibility Study noted that the \$25m preliminary budget for the upgrading was an amount that '... CAAB is fully able to absorb out of its net profits from on-going operations...'²⁹.


The AR (E7) concluded that the '... CAAB's financial position is strong, despite underlying concerns about lack of maintenance and the need for investment at all Bangladesh's airports.' In 2002, it had revenues of US\$ 34,1 million and a profit of US\$ 14,8 million. The CAAB have substantial cash in the bank resulting from this revenue surplus. Most of its revenue was in hard currency.


The financial analysis of the upgrading project found that the revenue from the project will thus be able to cover operating and related costs, but not the investment costs. A financial analysis of the investment over 20 years shows with a discount factor of 6 per cent that the investment has a negative present value of approximately USD20,3 million while the internal rate of return (FIRR) is 1,2%. This analysis justified the involvement of DSIF as it was judged that the project could not raise commercial finance. While true, this narrow focus on the project does not take account of CAAB's strong financial condition and good profitability. The FIRR in the AR is also considerably lower than the 6% reported in the FS which is based on different assumptions. In summary the justification for DSIF concessional finance is not well made.

There does not appear to be have been necessary to trade-off between commercial and development outcomes.

No data is available on the commercial and financial performance of CAAB on which it is possible to judge its operating performance




JC Rating -  Unsatisfactory – Insufficient information to analyse to commercial and financial performance of CAAB. The financial justification for DSIF funding appears weak given that CAAB's financial condition and profitability were good.



EQ 7 Overall Rating -  Partly satisfactory – Insufficient monitoring and verification information to assess whether DSIF achieved an acceptable balance between commercial and development outcomes. The financial justification for DSIF funding appears weak given that CAAB's financial condition and profitability were good.


EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>According to the 2004 AR(E.8 Economics), suitably implemented, the project was expected deliver a range of economic benefits, including:</p> <ul style="list-style-type: none"> • lower aircraft operating costs, due to fewer delays and diversions, and smoother operation at the airport; • shorter times for passengers and cargo passing through the airport; • lower maintenance and operating costs; • a capacity to accommodate larger, heavier aircraft such as the Boeing 747. <p>The AR (E8) also includes projections for the economic internal rate of return (EIRR), which in its central case was calculated at 33%, quantifying the strong economic benefits that the upgrading was expected to achieve.</p> <p>No data on what the actual EIRR achieved has been is available.</p> <p>A 2018 JICA commissioned survey found, inter alia, that the average annual growth of the number of air passengers from 2010 to 2017 was 6,4%³⁰. It is reasonable to infer that this growth has, at least in part, been sustained by the DSIF supported upgrading.</p> <p>On operation and maintenance, the March 2015 TA debriefing note disclosed that a total of 29 CCAB staff had attended one day training by Munck on civil works and airport ground lighting. In addition, CAAB h financed from own funds additional training programs abroad for 12 staff for seven days in Europe and USA. The field visit meeting with CAAB found that the technical capacity of Dhaka Shah Jalal International Airport increased, which in turn is contributing to the national economic development as well as facilitating attaining higher GDP growth. The airport can now handle the increased passenger as well as cargo flow. It can cope with need of the day i.e., higher number of flight incoming and outgoing flights.</p> <p>JC Rating -  Satisfactory – – Based on field visit meeting with CAAB taxiway renovation and strengthening enhanced capacity of airport.</p>	
JC 8.2 Level of commercial/financial viability of infrastructure	




²⁹ Section 2 page 12

³⁰ Data Collection Survey of Operation of Dhaka International Airport Japan International Cooperation Agency (JICA) - October 2018 <https://openjicareport.jica.go.jp/pdf/12320032.pdf>

<p>Due to a lack of financial and operating information it is not possible to analyse the incremental commercial and financial benefits of the upgrading. From the March 2015 handover report prepared by the design and supervision consultants, however, construction and final defect remedies were complete by March 2015 so that the upgrading was completed to a satisfactory (but undefined) standard. Subsequently in 2018 a JICA survey revealed that from 2010 to 2017 there had been an annual increase of 6,4% in passenger numbers at HSIA. It is reasonable to infer that this will have contributed in a positive manner to CAAB's financial and commercial performance.</p> <p>JC Rating -  Partly satisfactory - There is a lack of information on the commercial and financial performance of HSIA and CAAB since the project was completed ahead of schedule. Nevertheless, passenger volumes increased from 2010 to 2017 at an average annual rate of 6,4%. It is reasonable to infer that this growth has, at least in part, been sustained by the DSIF supported upgrading.</p>
<p>JC 8.3 Level of improvements in ESG achievement</p> <p>There is no information in debriefing notes on implementation and hand over on ESG performance. It is likely, however, that had there been ESG problems and issues that they would have been raised. It is implicit in the handover of the project that there were no ESG issues of note.</p> <p>JC Rating -  Partly satisfactory – There is a lack of any monitoring information on ESG performance. Appraisal documents, however, judged this airport upgrade as being overall ESG positive.</p>
<p>EQ 8 Overall Rating -  Partly satisfactory Field visit meeting with CAAB confirmed that taxiway renovation and strengthening enhanced capacity of airport. There is, however, a lack of information on the economic viability of HSIA and its financial/commercial performance since the project was completed. Nevertheless, passenger volumes increased from 2010 to 2017 at an average annual rate of 6,4%. It is reasonable to infer that this growth has, at least in part, been sustained by the DSIF supported upgrading.</p>

<p>EQ 10 Project risk management of DSIF</p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
<p>JC 10.1 Quality of risk management systems and policies on long-term sustainability</p>	
<p>The AR listed the risks that had to be managed for successful project completion:</p> <ul style="list-style-type: none"> • efficient implementation of the project; • good management of the airport by the CAAB; • proper attention to maintenance; • adequate training of staff; • environmental monitoring to ensure compliance with local regulations. <p>Given that this is an upgrade of an existing facility, such generic risks can be viewed as moderate and relatively easy to mitigate with good project management.</p> <p>JC Rating -  Satisfactory – risks well defined and moderate given that this is an upgrade and modernisation of an airport in operation.</p>	
<p>JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio</p>	
<p>The AR and project document set the following indicators:</p> <p>Output</p> <ul style="list-style-type: none"> • Number of taxiways rehabilitated and commissioned. • Number of person days with performed training. <p>Outcome</p> <ul style="list-style-type: none"> • Capacity utilization of the airport (actual flights, passengers and cargo compared to assessed capacity). • Days over the year for which the airport and the equipment are available (compared to expected availability). <p>Although two are described as outcome indicators, they in fact relate to outputs. The entire monitoring and verification approach is centred on outputs. Moreover, the selected indicators are generic and limited. There are no development outcome indicators. Moreover, they have not been designed to track the specific components of the upgrade. No indicators on the replacement and modernisation of the radar and air traffic control systems were specified. The design and supervision reports focus primarily on the civil engineering aspects of the project, in particular the strengthening of the aprons and taxiways. These reports, including the final verification report, are general in nature and in insufficient detail to provide useful information for a development reporting framework.</p> <p>JC Rating -  Unsatisfactory – poorly defined and deficient indicators and targets in AR makes it not possible to track implementation of project and outcomes other than in the most general output focused manner.</p>	

EQ 10 Overall Rating -  Partly satisfactory Risks well defined. Results framework to track and quantify development outcomes was missing.

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
<p>The emphasis of reporting by HSIA to DSIF was on operating efficiency with none on development outcomes. It is evident that the result management system at DSIF focuses on outputs. Reporting by the monitoring and verification consultant appointed by DSIF to oversee the project implementation ended with the issue of Verification, End of Defect Liability report in March 2015 one year after project completion. This report stated that there were no defects but provided no quantitative data to support this assertion.</p> <p>The indicators are general in nature and, more importantly, do not specifically cover key components of the project, most notably the upgrading of the radar and air traffic control systems so that HSIA complies with ICAO rules and standards.</p> <p>JC Rating -  Unsatisfactory – Insufficient reporting requirements that focus on poorly defined output indicators that are too general and difficult to attribute to the project. No DAC compliant outcome indicators were set.</p>	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>As already noted, the result management system at DSIF focuses on outputs. All of the following four output and outcome indicators set out in the AR and PD relate to outputs:</p> <p>Output</p> <ul style="list-style-type: none"> • Airport capacity improved (measured in number of passenger/machinery/tons of cargo); • Number of person days of training. <p>Outcome</p> <ul style="list-style-type: none"> • Capacity utilisation of the airport (number of passenger/machinery/tonnes of cargo compared to expected); • Number of days airport/equipment can be kept open (in relation to expected). <p>None of the above indicators is well enough defined to provide data that could be uploaded into a DSIF portfolio results management system. The most serious weakness is a lack of DAC compliant outcome indicators. Client reporting ended in March 2015 just before the end of the no defects period after which HSIA is fully responsible for the upgrade.</p> <p>JC Rating -  Unsatisfactory – No reporting on outcomes. Output reporting uses indicators that are not sufficiently linked to the objectives of the project, such as the enhanced and modernised radar and air traffic control systems.</p>	
<p>EQ 11 Overall Rating JC Rating -  Unsatisfactory – No reporting on outcomes. Output reporting uses indicators that are not sufficiently linked to the objectives of the project, such as the enhanced and modernised radar and air traffic control systems.</p>	

Field visits and calls



3.1.1 3 May 2021 Skype call with Bjarne Lading Rasmussen – Verificant Consultant, Grontmij A/S

3.1.1.1 Key findings:

- Long delay between DSIF approval and implementation.
- Project budget was unrealistically low and had to be increased. Despite this scope of project had to be reduced with the deletion of air traffic control components.
- Wet soil and drainage were major technical challenges
- Four Danish contractors bid
- Satisfactory implementation – one challenge during the work was ensuring that the taxiways were level and dealing with rutting of the concrete.

3.1.2 June 21 Meeting with CAAB

Conducted by Avijit Poddar Particip Consultant in Bangladesh

Case Study of DISF Cooperation (Investment) with Dhaka Hazarat Shahjalal International Airport (DHSIA)

3.1.2.1 Introduction:

As a part of evaluation, data was collected using key informant interview (KII) and group discussion (GD) with relevant Civil Aviation Authority of Bangladesh (CAAB) in June 2021.

- Chief Engineer CAAB (CE CAAB), Md. Abdul Malek
- Project Directors (PD) of DHSIA Development Project – Maksudul Islam
- (both former and current) participated in the KII.
- Director Finance - Mohammad Moazzem Hossain
- Chief Economist of CAAB.

3.1.2.2 Objectives:

Three-fold objectives of the case study data collection were as follows:

1. To understand why DISF chosen for investing in the development,
2. To explore the quality of Danish Assistance/support,
3. To gather information on the strength and weakness of DISF support

3.1.2.3 Findings:

1. Why DISF was approached?

In 2001, CAAB felt the need for undertaking some up gradation works in Dhaka Hazarat Shahjalal International Airport (DHSIA). They identified that that the radar system, equipment of air-traffic control tower, and the taxing way need to be up graded to cope with the then load of the airport. Relevant personnel were assigned to conduct research on identifying suitable donors and/or development partners. ADB, IDB, JAICA SIDA, EKN and Danida were in the list. All the listed agencies were communicated and two agencies (Danida and JAICA) were selected for continuing further negotiation, because both of the agencies showed their interests for investing. Moreover, both the countries have the necessary capacity in terms of equipment availability and technically skilled manpower. After preliminary discussions with Danida and JAICA, formal proposal in the form of technical assistance project proposal was sent to Ministry of Civil Aviation and Tourism (MoCAT). It took long eight years to get the final approval from the Ministry.

It is worth mentioning that after getting the approval of MoCAT, the investment was utilized in up grading the taxing way of the airport. Because initial agreed amount was enough for purchasing and installation of necessary equipment for radar station and flight control system, after eight years, the price has substantially gone up. Therefore, the investment was utilized for modernizing the taxing way. However, the CAAB authority till date could not meet up the modernization of radar and flight deck system.

The prime reasons for approaching Danida, according to Director Finance CAAB, was Danish investment support comes in two parts: (i) 40 percent of the same comes as grant and (ii) rest as low interest credit. On the other hand, the full amount of JICA investment is credit and interest rate is also higher as compared to Danish.

2. Response of DSIF

Apprising the DSIF response, the interacted CAAB personnel clearly mentioned that the positive reply came fast, despite the delay of the MoCAT. It was appropriate for modernization of the taxing way and the technical inputs were of very high quality. Till date no maintenance is needed. The technical experts were highly qualified having very high levels of skills.

3. Importance of Danish Support

Commenting on the subject all the interacted persons shared that the support/ investment was very much important for CAAB as well as for Bangladesh. It has laid important contribution in increasing the GDP.

4. Importance of Danish Contractors/technical assistance

The contractors, technical experts and equipment contributed substantially to attaining high quality output. That is why world standard modernization of the taxing way was possible through utilizing the assistance.

5. Importance of financing package in taking decision to approach DSIF

The Finance Director CAAB shared that the decision to approach DSIF is very much important for them, because Danish financing enables getting things done by spending a fund where 40 percent is non-refundable and repayment schedule is expanded over 40 years.

6. Quality of Feasibility Study funded by DSIF

According to the respondents, the quality of the feasibility study made by the Danish Experts was very good. The experts involved in the study was highly skilled professionals. They produced very comprehensive and substantially rich feasibility report. GoB has accepted the report without any hesitation.

7. Quality and Speed of DSIF Appraisal

The DSIF appraisal process was quite fast and the quality was highly satisfactory.

8. Addressing Legal Issues

All pertinent to investment legal issues were addressed comprehensively with a high professional manner and without any delay. CAAB authority mentioned that it was highly satisfactory.

9. Outputs and its Quality

The output of DSIF investment package in Civil Aviation

The output of the investment was modernization and expansion of the taxing way. It was completed in 18 months instead of 21 planned months during 2012 – 2013. Since the completion it is functioning in full capacity and no maintenance work was necessary till date.

10. Outcomes

The technical capacity of Dhaka Shah Jalal International Airport increased, which in turn is contributing to the national economic development as well as facilitating attaining higher GDP growth. The airport now can handle the increased passenger as well as cargo flow. It can cope with need of the day i.e., higher number of flight incoming and outgoing flights.

11. Ease of working with DSIF

According to the CAAB managers and policy planners, it is easy to work with Danish experts during appraisal and project implementation because of high professional attitude and the same is ranked as very good.

12. Strength and Weakness of DSIF Financing

High professionalism, speed, technical and administrative efficiency, comprehensiveness in addressing legal issues, no hidden conditions, timeliness, etc., are the strengths of DSIF financing. On the top of all mentioned strength components, overall strength of Danish investment is the admixture of grant and low interest credit. It needs to mention in this context that all long-term loans provided by JAICA is 40 percent over quoted. Because they calculate the inflation and mount it with principal amount in addition to interests. However, in times insufficient fund availability (Example the airport could not modernize the radar system and flight operation deck with DSIF investment because of its adequateness).

13. DSIF can improve the products / services by undertaking assistance projects with more funds and more flexibility. Thus, DSIF can contribute more to the development of Bangladesh and countries alike.

Case study: Ethiopia

4 Ethiopia: Assela Wind Farm

Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> • Diversification of generating sources, although hydro will still dominate; in large part because of the 6GW Grand Ethiopian Renaissance dam. • Government policy to keep tariffs affordable for low-income groups means that the project is a long way from financial viability. • Good opportunity for Siemens Gamesa that will manufacture key parts of turbines in Denmark. 	





Summary			
Project name	Assela Wind Farm 1 - 100MW approved construction about to begin Assela Wind Farm 2 - 150MW concept note October 2020		
Type of project	Mixed credit		
Project No.	IFU: F1744-01	UM: 2018-14197	
Description	<ul style="list-style-type: none"> • A 100 MW wind farm installed delivering on average 330 GWh of electricity a year to the national grid avoiding the release of 175.890 ton of CO2 annually. • Diversification of Ethiopia's energy mix helping mitigate against risk of climate events that impact hydro power. • Improved capacity of Ethiopian Electric Power (EEP) to operate and manage wind farms. <p>The Ministry of Water, Irrigation and Energy (MOWIE) is responsible for the sector policy, and EEP and EEU are both attached to MOWIE. Assela is the 5th wind farm following Ethiopia has presently four wind farms that have been commissioned in recent years:</p> <ul style="list-style-type: none"> • the 120MW Ashegoda Wind farm (funded by France) in northern Ethiopia • the Adama I and II wind farms (funded by China) located not far from Assela. • 120 MW Aysha II under construction in south eastern Ethiopia. <p>A concept note for Assela 2, a 150MW expansion adjacent to Assela 1, was reviewed by IFU investment committee and Danida programme committee in late 2020.</p> <p>The project is situated on a high plateau north -west of the community of Iteya. The area borders in eastern direction to the Adama –Assela road and a natural protected area and in western direction to the Great Rift Valley. In southern direction, the town of Iteya forms a natural border of the project site. In northern direction, the elevation above ground decreases from about 2.200 m above sea level to 1.800 m Ethiopian Electric Power (EEP). Connection to the national grid should not be difficult as two high voltage overhead power lines run across the western part of the project site.</p>		
Sector	Power		
Country	Ethiopia		
Sponsor	Ethiopian Electric Power (EEP) a state-owned enterprise under the Ministry of Water, Irrigation and Energy (MOWIE)		
Other stakeholders	none		
Clearance in principle	Assela 1 – November 2017 Assela 2 - IFU IC October and Danida PC November 2020		
Approval/Binding Commitment	Assela 1 – April 2018	Loan Agreement Date Assela 1	17 June 2020
Danish Bank	Danske Bank		
Loan Duration + Grace Period	Loan terms approval IFU to Danske Bank 27 10 2020 1 st repayment Dec2025 i.e. grace of 5 years Repayments over 15 years Total €146m less DSIF grant 29 = Net €117 m		
Project Amount and funding plan	Total project budget: DKKm 1.265 Of which DBF financing: DKKm 1.260 DBF grant (see below) DKKm 727		

Summary																															
Danish Exporter	Siemens Gamesa Renewable Energy (listed on Madrid Stock Exchange)- 6.000 or 25% of workforce is in Denmark, other factories in Spain, Morocco and other countries. Started in 1980 as Bonus Energy opens its Aalborg blade factory in Denmark.																														
EKF guarantee	17 June 2020																														
Implementation status	EEP tender evaluation report June 2019. 2 Danish companies invited to bid (Vestas Wind Systems and Siemens Gamesa Renewable Energy). Vestas missed the bid deadline so that there was only 1 compliant bid, Siemens, which was basis for negotiations with EEP. Contract signed December 2020 Commissioning planned Q1 2023																														
Feasibility study details	Full feasibility study funded by AfDB and prepared by Lahmeyer International in 2017 covering, inter alia, technical, commercial, economic, social and environmental issues.																														
Subsidy – rationale and key features	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="text-align: right;"><i>DSIF Support</i></th> <th style="text-align: right;"><i>DKKm</i></th> </tr> </thead> <tbody> <tr> <td>Cash grant element of loan</td> <td></td> <td style="text-align: right;">454</td> </tr> <tr> <td>Interest subsidy</td> <td></td> <td style="text-align: right;">127</td> </tr> <tr> <td>Margin to Danske Bank</td> <td></td> <td style="text-align: right;">10</td> </tr> <tr> <td>Technical Assistance including consultants:</td> <td></td> <td style="text-align: right;">15</td> </tr> <tr> <td>1) Design, tender and monitoring of land acquisition/compensation,</td> <td></td> <td></td> </tr> <tr> <td>2) Monitoring/verification and</td> <td></td> <td></td> </tr> <tr> <td>3) Review, publication/dissemination of results etc.</td> <td></td> <td></td> </tr> <tr> <td>Budget margin 20%</td> <td></td> <td style="text-align: right;">121</td> </tr> <tr> <td>DBF total subsidy</td> <td></td> <td style="text-align: right;">727</td> </tr> </tbody> </table> <p>Concessionality: 50%</p>		<i>DSIF Support</i>	<i>DKKm</i>	Cash grant element of loan		454	Interest subsidy		127	Margin to Danske Bank		10	Technical Assistance including consultants:		15	1) Design, tender and monitoring of land acquisition/compensation,			2) Monitoring/verification and			3) Review, publication/dissemination of results etc.			Budget margin 20%		121	DBF total subsidy		727
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Budget margin 20%		121																													
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Country Context	The Assela wind farms are part of GoE strategy of diversifying the energy mix so that it is less dependent on hydropower only and hence less affected by droughts. Ethiopia is expanding its generating capacity and expanding distribution to increase access to electricity across the country.																														

Evaluation Questions





EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>Assela fits well with the “World 2030³¹” strategy that states:</p> <ul style="list-style-type: none"> • Denmark will invest in inclusive and sustainable growth in the developing countries with a special focus on energy, water, agriculture, food and other areas, where Denmark has particular knowledge, resources and interests. • We will prioritise initiatives within clean water and sustainable energy and work to ensure that poor population groups have access to sustainable energy and water <p>Moreover, the project conforms with Danida’s project selection criteria, in particular:</p> <ul style="list-style-type: none"> • Ethiopia is a low income : GNI per capita below USD 3,895 (2019) and countries where Denmark has a representation • There are Danish companies that are internationally competitive in the production of wind turbines. • Projects will comply with international sustainability criteria including IFC performance standards and UN guiding principles for business and human rights: • Address adverse effects on environment or climate, supporting a transition to low carbon economy. • Coherent with Denmark - Ethiopia Country Policy Paper 2018-2022 • Project size: minimum size of DKK 100 million. <p>JC Rating - ● Satisfactory: Assela aligns well MFA development policies and strategy in Ethiopia.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders’ views into account	
<p>Assela fits well with relevant Ethiopian national development policies, notably:</p> <ul style="list-style-type: none"> • The 2014 Ethiopia SE4All National Action Plan includes the focus area for diversification through the installation of geothermal power plants, wind farms and solar systems. The GTP sets a target of 10GW for 	

³¹ The World 2030 - Denmark’s strategy for development cooperation and humanitarian action, January 2017
 Evaluation of Danida Sustainable Infrastructure Finance Programme | 2019-39160
 Working paper - Case study fiche – Particip GmbH

<p>hydro by 2014/15, and the expansion plan sets a target of 5GW for geothermal, 1,5GW for wind, 0,3GW for solar and 12,4GW for hydro by 2037.</p> <ul style="list-style-type: none"> • The 2016 Ethiopia Growth and Transformation Plan II (GTP II) (2015/16-2019/20) Volume I: Main Text - National Planning Commission May 2016, includes as a major target increasing the power generating capacity of the country from 4.180MW in 2014/15 to 17,2 GW by 2019/20; of which, <ul style="list-style-type: none"> ○ 13,8GW from hydropower, ○ 1,2 GW from wind power, ○ 2,2 GW from other sources: solar, geothermal etc <p>Consequently 15–20 percent of the energy production will come from wind, geothermal, sun and other renewable sources, as hydropower is subject to uncertainty due to increasing variations in seasonal rainfall due to climate change. Given the expected increase in demand for electricity (nearly 10 percent, annually), complementary energy resources must be developed to mitigate the risk of overreliance on hydropower. Together, Assela 1 and 2 will add 250 MW of generation capacity, which constitutes around 6% of the present installed capacity (and around 1,5% of the capacity projection in GTP II for 2020).</p> <p>JC Rating -  Satisfactory: Assela aligns well Ethiopia's national development policies and plans for the energy sector, including the diversification of the energy mix.</p>
<p>JC 1.3 Added value of Project Preparation Facility (PPF)</p>
<p>JC Rating - Not applicable – AfDB funded 2017 feasibility study</p>
<p>JC 1.4 Complementarity with development partners operations and strategies</p>
<p>A number of development partners have been active in the development of wind energy in Ethiopia. AFD supported the 120MW Ashegoda Wind farm (funded by France) in northern Ethiopia which was the first to come into operation in 2013. The China Eximbank financed the Adama I and II wind farms that are located not far from Assela both of which have started generation. It also financed Aysha II under construction in south eastern Ethiopia which is close to completion.</p> <p>The feasibility study for Assela issued in 2017 was funded by AfDB.</p> <p>Assela is complementary with other development partners, particularly the World Bank, AfDB and the AFD, which are all active within the energy sector. AFD supported the first wind farm in Ethiopia that was commissioned in 2013. China Eximbank financed two wind farms: the 51-MW Adama I commissioned in 2012 and the 153-MW Adama II commissioned in 2015; both in central Ethiopia³².</p> <p>The Danish Embassy in Addis Ababa has been responsible for the Ethiopia - Accelerating Wind Power Generation in Ethiopia programme that involves, inter alia, Ministry of Water, Irrigation and Electricity of Ethiopia (MOWIE), Ethiopian Electric Power (EEP), Ethiopian Energy Authority (EEA), Ethiopian Electric Utility (EEU) and the World Bank.</p> <p>The WB 2018-2022 Country Partnership Framework for Ethiopia 2018-2022 includes as a key goal: the number of people with access to electricity (on- and off-grid) will be increased from a base of 25% in 2016 to 50% by the end of FY21.</p> <p>The WB has supported a number of electricity projects in Ethiopia including:</p> <ul style="list-style-type: none"> • P097271 Electricity Access (Rural) Expansion (EAREP) \$133m • P101556 Electricity Access Expansion Project II (EAREP2) \$130m • P119893 Electricity Network Reinforcement & Expansion (ENREP) \$200m <p>It is evident that Assela is complimentary to wind farms being supported by other development agencies and is working alongside donors to support the development of wind power generation in Ethiopia.</p> <p>JC Rating -  Satisfactory – Assela is complementary to the wind power operations and strategies of development partners in Ethiopia.</p>
<p>JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts</p>
<p>While the economic performance of Ethiopia has been very strong over the last two decades with high rates of growth, it remains a low-income country with a (GDP per capita about \$900) and a Danida priority country. The Assela wind farms fits well with, and are complimentary to, the MFA Ethiopia - Accelerating Wind Power Generation in Ethiopia. Electrification and expanding access to electricity is critical to economic development. The April 2018 minutes of Council for Development Policy reviewing the project document commented: CDP found that the project was a good example of how DBF could be involved in poor countries, which were considered high risk by commercial investors.</p> <p>JC Rating -  Satisfactory – The selection of the Assela 1 and 2 projects is appropriate given the potentially high development outcomes and impacts</p>
<p>EQ 1 Overall Rating –  DSIF's support for the Assela wind farms is relevant to the expansion of generation capacity in Ethiopia and the diversification of the energy mix that is dominated by hydropower. It is</p>




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complimentary with the activities of other donors and development agencies in the electricity sector in Ethiopia, including AfDB, AFD, China Eximbank and the World Bank.

EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p>The promotion of clean energy is a central objective of Denmark's overall development policy. In Ethiopia, Danida financed a DKK 28m TA programme undertaken by Energinet³³ with EEP - Accelerating Wind Power Generation, Ethiopia, 2016-19. It worked on capacity building and advice on efficient integration of variable renewable energies in the electricity system with main focus on system operation, grid security and grid codes. EEP to support the integration of different intermittent renewable energy sources into the national grid. The partners included Ministry of Water, Irrigation and Electricity of Ethiopia (MOWIE), Ethiopian Electric Power (EEP), Ethiopian Energy Authority (EEA), Ethiopian Electric Utility (EEU), and the World Bank. Both the Denmark - Ethiopia Country Policy Paper 2018-2022 and the Danish Country Programme for Ethiopia 2018-2022 refer directly to the Assela 1 Wind Farm project and also supporting the management of wind energy resources</p> <p>Assela fits well this Danida programmes and plans in Ethiopia. Moreover, there are Danish companies that are global leader in the production of wind turbines.</p> <p>It is noteworthy that the MFA Programme Committee meeting on 5 November 2020 considered two complimentary projects:</p> <ol style="list-style-type: none"> 1. Enhanced Danish-Ethiopian Partnership (Danish Embassy Addis Ababa) 2. DSIF –Assela 2 Wind Farm Project, Ethiopia <p>JC Rating -  Satisfactory - Assela is clearly coherent with MFA development policies and strategy in Ethiopia as demonstrated by the MFA Programme Committee meeting in November 2020 when both Assela 2 and Enhanced Danish-Ethiopian Partnership were considered.</p>	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p>Danida financed a TA programme undertaken by Energinet with EEP - Accelerating Wind Power Generation, Ethiopia, 2016-19. It worked on capacity building and advice on efficient integration of variable renewable energies in the electricity system with main focus on system operation, grid security and grid codes. EEP to support the integration of different intermittent renewable energy sources into the national grid, More recently the Danish Embassy in Ethiopia has been working on the Enhanced Danish-Ethiopian Partnership (EDEP).</p> <p>All DSIF project have to cleared by the Danida Programme Committee that also reviews other forms of Danida assistance. The PC at its 5 November 2020 meeting reviewed the EDEP and Assela 2.</p> <p>JC Rating -  Satisfactory - DSIF's Assela programmes are well linked to Danida's general and strategic support initiatives in Ethiopia.</p>	
JC 2.3 Danish business links with beneficiary countries	
<p>Following consolidation there are two 2 Danish companies that manufacture wind turbines: (Vestas Wind Systems and Siemens Gamesa Renewable Energy). Vestas is the number one producer globally. Both were invited to bid. Vestas, however, missed the bid deadline so that there was only one compliant bid, Siemens, which was accepted.</p> <p>JC Rating -  Satisfactory - Assela 1 and 2 offer excellent opportunities for Danish equipment to be exported and installed in wind farms.</p>	
EQ 2 Overall Rating -  Satisfactory - DSIF through the Assela wind farm projects has coordinated and aligned well with Danida development activities in Ethiopia. Assela 1 and 2 offer excellent opportunities for Danish equipment to be exported and installed in wind farms.	

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
The project is not bankable due to the low proposed offtake prices set by the government which has a policy of making electricity affordable in a country with very high levels of poverty and low household incomes.	

³³ Energinet is a Danish global energy consultancy. It is 'an independent public enterprise owned by the Danish Ministry of Climate, Energy and Utilities' <https://en.energinet.dk/About-us/Organisation/Energinet-Energy-Consultancy>




JC Rating -  Satisfactory Project is not bankable due to low offtake tariffs. Financial additional is evident as DSIF concessional funding was required.
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality
For DSIF support it was necessary for a comprehensive feasibility study to be prepared. This was funded by AfDB. It covered in detail, inter alia, technical, economic, financial, environmental and social aspects of Assela 1. The comprehensive Environmental and Social Impact Study ³⁴ (ESIS) that was prepared as part of the Feasibility Study provides, inter alia, a framework for a land acquisition and resettlement plan, including livelihood restoration, according to IFC Performance Standard 5 ³⁵ .
JC Rating -  The feasibility study and in particular the ESIS should help ensure that Assela 1 is implanted in international standards of good practice.
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding
JC Rating - Not applicable no other financing
EQ 5 Overall Rating –  Additionality was limited for Assela 1 since DSIF provided 99.5% of the funding the high-quality feasibility study does bring some valuable non-financial additionality. DSIF also insisted on a comprehensive feasibility study that was funded by AfDB.

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
	The project is in the early stages of implementation with the Siemens Gamesa contract having been signed in December 2020. Commissioning is planned for Q1 2023 JC Rating – n/a
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
	The feasibility study and the EEP results framework for Assela 1 indicate that the economic benefits and development outcomes from the project will be indirect through the delivery of 100MW of wind generation capacity. Together with the 15MW planned for Assela 2, a total of 250MW will be added to Ethiopia's capacity, representing 1,5% of the 17GW ³⁶ planned for 2020. Connection to the national grid is not expected to be difficult as the wind farm site borders in the western part to a 132 kV and a 230 kV double circuit overhead transmission line. The later leads from 230 kV Koka-Dire Dawa substation to Melke Wakena Hydro Power Plant. The 132 kV line leads from 45/132 kV Koka substation to Assala substation via Awahs II / III Hydro Power Plant substation. There will be construction jobs created during the building of the wind farms. Permanent employment opportunities during operation will be modest. Economically, Assela will contribute in a modest way to the diversification of Ethiopian's generation capacity making it less reliant on hydro power. It should be noted, however, that the Renaissance dam on the Blue Nile near the border with Sudan will, when fully operational, have a generation capacity of more than 6GW of electricity. JC Rating -  Provisional satisfactory assuming that implementation is undertaken as planned.
JC 6.3 Environmental, social and governance (ESG) risk management	
	The wind farm will be located on a sparsely populated site south of Addis Ababa. A comprehensive Environmental and Social Impact Study that was prepared as part of the Feasibility Study for Assela 1 concluded that there are both positive and negative environmental and social effects of the project, and that the main concern is the local social impact: "Fair compensation and replacement/restoration of affected assets will play a key role in this context and should be detailed in the Land Acquisition and Resettlement Plan". The adverse environmental impact is small: "the project site does not provide high valuable habitats in terms of biodiversity and the anticipated adverse impacts on flora and fauna are of a very local nature". The project is hence considered to be "Medium Risk" (B) during operation and "Medium High Risk" (B+) during pre-construction and construction, according to the European Development Finance Institutions (EDFI) classification ⁵ . The emphasis during project implementation will therefore be on the requirement for a land acquisition and resettlement plan, including livelihood restoration, following IFC Performance Standard 5. Assela 2 is not expected to have any more serious ESG issues as it will be located adjacent to Assela 1. JC Rating -  Provisional satisfactory assuming that implementation is undertaken as planned.

³⁴ Environmental and Social Impact Assessment Report June 2017 Lahmeyer International GmbH. Funded by AfDB

³⁵ Guidance Note 5 Land Acquisition and Involuntary Resettlement

³⁶ Ethiopia Growth and Transformation Plan II (GTP II) (2015/16-2019/20) Table 1.1: Selected GTPII Targets – indicator 4.2 Energy


JC 6.4	Contribution to climate change mitigation, green and inclusive development
Ethiopia's electricity generation capacity is almost 100% from renewable sources with only about 140MW ³⁷ coming from thermal sources. Additional wind generation will be alongside the expansion of hydro power and geothermal generation, all of which are renewables.	
JC Rating -  Satisfactory – wind power is a renewable. Limited substitution of greenhouse gas generating capacity due to dominance of hydro power in Ethiopia.	
JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth	
JC Rating -  Satisfactory - wind power is compliant with HP	
EQ 6 Overall Rating  Provisional satisfactory assuming that implementation is undertaken as planned.	



EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)	
JC Rating - Not applicable – project yet to be implemented	
JC 7.2 Strong ESG performance of DSIF projects	
The Environmental and Social Impact Study assesses that adverse environmental impacts are likely to be small: “the project site does not provide high valuable habitats in terms of biodiversity and the anticipated adverse impacts on flora and fauna are of a very local nature”.	
The ESIS proposes that a fair Land Acquisition and Resettlement Plan be drafted. It also recommends social mitigation measures that should include the provision of electricity to the non-electrified villages in the project area and the provision of job opportunities for the local population.	
JC Rating - Not applicable although adverse environmental impacts are likely to be small	
JC 7.3 Satisfactory financial returns and portfolio performance	
The feasibility study includes an estimate of the annual energy production and the annual cost of operation and management. Based on this, and an estimated interest rate for the loan (that EEP would pay to the government), the cost of the energy produced, i.e. the break-even price of electricity, which will make it possible to pay back the loan was calculated; the Levelized Cost of Energy (LCOE). Assuming Assela 1 as a commercial project financed with a 6% loan, the LCOE would according to the appraisal report be 52,5 Euro/MWh. This is more than five times what EEP receives presently for the electricity it delivers (around 10 Euro/MWh), and also what is necessary for commercial viability at 51 Euro/MWh as planned, of which EEP would receive around 31 Euro/MWh (the rest going to the distribution company, EEU).	
Even with a concessional loan from DSIF with 50% concessionality, the appraisal calculates the break-even price (LCOE) to be 28,2 Euro/MWh, still nearly three times the price EEP currently receives. Although the appraisal report discusses increases in electricity tariffs it is unclear whether the Government of Ethiopia would sanction such increase given low incomes in the country. It is therefore unlikely that independent power producers can be attracted to Ethiopia in the foreseeable future, as noted in the April 2018 minutes of Council for Development Policy commented that: The Council found that the project was a good example of how DBF could be involved in poor countries, which were considered high risk by commercial investors.	
The feasibility study (14.4) finds that without substantial grants (above the level provided by DSIF) the project is not financially feasible project as the tariff is too low to cover operating expenses and debt service. Consequently, the Government will probably be repaying the loan to Danske Bank with a combination of EEP transfers from the project and subsidies.	
JC Rating - N/A as project has not yet been built. Likely to be unsatisfactory - tariffs have to be low, and are below the level required for financial viability, to be affordable in a low-income country such as Ethiopia affordability for infrastructure services is low, especially in rural areas where there are high levels of extreme poverty. Raising tariffs to levels where EEP can cover its costs is a medium to long term goal. IPPs are unlikely to be viable in the coming years.	
EQ 7 Overall Rating N/A as project has not yet been built. Potentially partly satisfactory - Project is yet to be implemented. Financial viability of a wind farm in a low-income country such as Ethiopia is not possible at present, tariffs have to be low to be affordable, especially in rural areas where there are high levels of extreme poverty. Raising tariffs to levels where EEP can cover its costs is a medium to long term project.	



EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	

³⁷ Per 2017 Feasibility Study: Table 2-3: Ethiopian power plant fleet: Dire Dawa, Awash 7 Kilo, Kality and Repi power stations
 Evaluation of Danida Sustainable Infrastructure Finance Programme | 2019-39160
 Working paper - Case study fiche – Particip GmbH

<p>The 2017 Feasibility Study (13.6) estimates the ERR under a range of scenarios. It concludes that Assela wind farm 1 is considered as feasible from the economic point of view, because:</p> <p>The economic internal rate of return (EIRR), which represents the rate of return that equates the present value of costs with the present value of benefits is greater than the economic discount rate, in this case 10%.</p> <p>The economic net present value (ENPV) which is derived by discounting the net benefits, is positive.</p> <p>The benefit-cost ratio (B/C) which represents the ratio between the present value of benefits and present value of costs is greater than 1.</p> <p>As would be expected the ERR is higher than the FRR. Given that construction of Assela 1 is yet to begin, it remains to be seen whether the ERR is as high as forecast. Nevertheless, it is likely to be positive.</p> <p>JC Rating - N/A as project has not yet been built. Expected to be satisfactory. Given that construction of Assela 1 is yet to begin, it remains to be seen whether the ERR is as high as forecast. Nevertheless, it is likely to be positive.</p>
<p>JC 8.2 Level of commercial/financial viability of infrastructure</p>
<p>As noted in JC 7.3, the feasibility study (14.4) finds that without substantial grants (above the level provided by DSIF) the project is not financially feasible as the tariff is too low to cover operating expenses and debt service. Consequently, the Government will probably be repaying the loan to Danske Bank with a combination of EEP transfers from the project and subsidies.</p> <p>JC Rating - N/A as project has not yet been built. Likely to be unsatisfactory - tariffs have to be low, and are below the level required for financial viability, to be affordable in a low-income country such as Ethiopia affordability for infrastructure services is low, especially in rural areas where there are high levels of extreme poverty. Raising tariffs to levels where EEP can cover its costs is a medium to long term goal. IPPs are unlikely to be viable in the coming years.</p>
<p>JC 8.3 Level of improvements in ESG achievement</p>
<p>The Environmental and Social Impact Study assesses that adverse environmental impacts are likely to be small: "the project site does not provide high valuable habitats in terms of biodiversity and the anticipated adverse impacts on flora and fauna are of a very local nature".</p> <p>The ESIS proposes that a fair Land Acquisition and Resettlement Plan be drafted. It also recommends social mitigation measures that should include the provision of electricity to the non-electrified villages in the project area and the provision of job opportunities for the local population.</p> <p>It is therefore likely that there will be compliance with acceptable ESG standards is likely to occur.</p> <p>JC Rating – N/A as project has not yet been built. Potentially satisfactory Given that adverse environmental impacts are likely to be small.</p>
<p>EQ 8 Overall Rating - N/A as project has not yet been built. Potentially partly satisfactory. Very low electricity tariffs make it likely that even with DSIF grants Assela 1 is not financially viable. ERR and ESG performance expected to be satisfactory.</p>

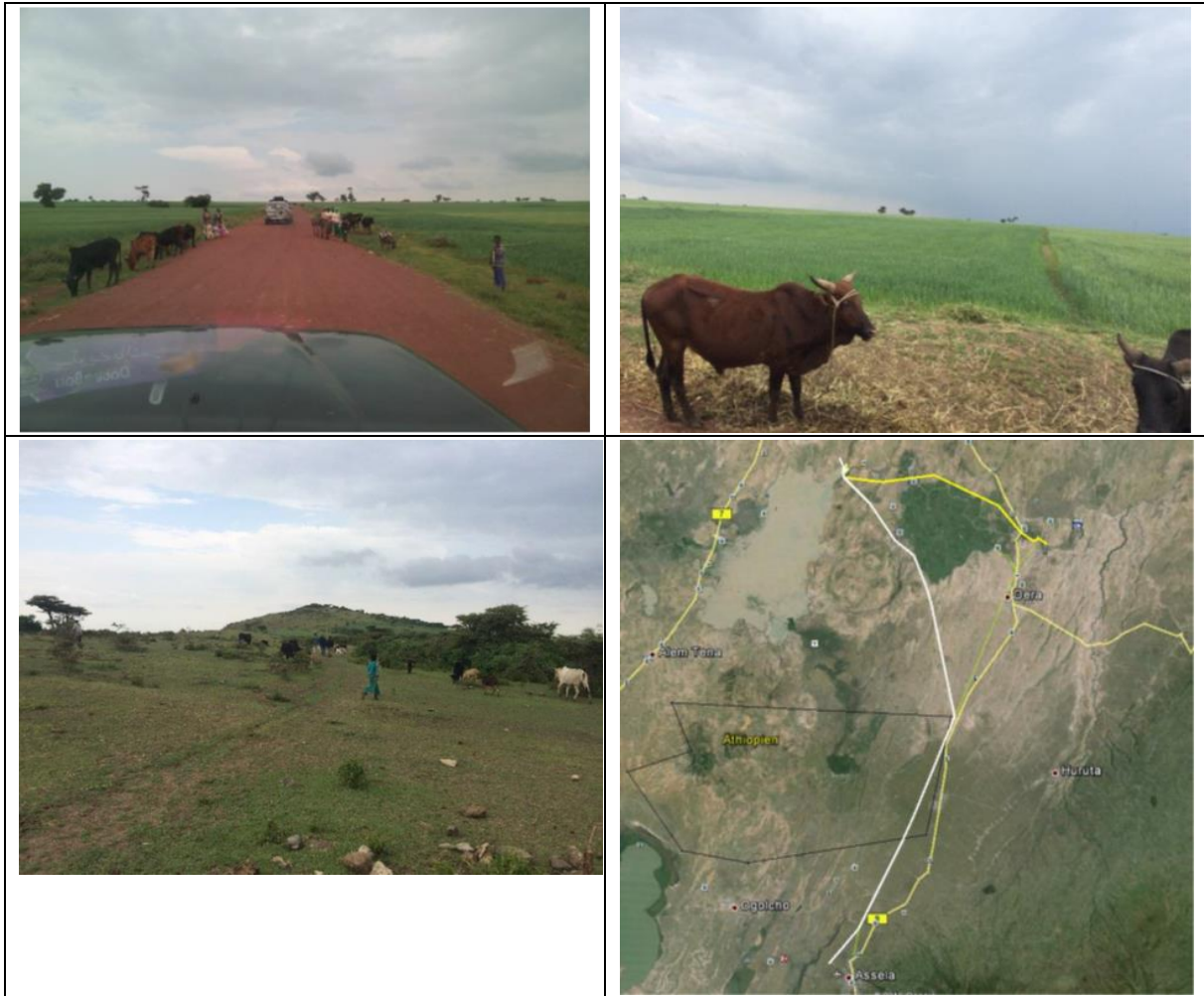
<p>EQ 10 Project risk management of DSIF</p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
<p>JC 10.1</p>	<p>Quality of risk management systems and policies on long-term sustainability</p>
<p>The project document identifies the following major risks:</p> <ul style="list-style-type: none"> • EEP takes the necessary steps to integrate the intermittent renewable sources (particularly wind and sun) into the grid to ensure that curtailment (energy produced is not up-loaded to the grid during low-peak as hydropower is given priority. This has been an issue for the Adama I and II wind farms. A current Danish support programme is aimed at helping EEP resolve this issue. • For the increased energy generation to have a positive impact on growth and universal access, the Government will have to invest in transmission and distribution (T&D) to make this happen. Expanding T&D will require substantial funding from development partners which is uncertain. Ethiopia aims to reach universal electricity access by 2025 in accordance with the National Electrification Program (NEP) - launched in November 2017 –supporting the implementation of strategic priorities for sustainable energy sector development and scaling up electrification defined in the National Electrification Strategy (launched in June 2016). • Experience from projects in other countries indicates that land acquisition and compensation may cause delays. This risk is considered medium to major, but the residual risk is considered medium. <p>A risk that has arisen recently is that Ethiopia has approached its development partners to reschedule its official obligations. Since debt servicing will be by the Ministry of Finance there may be an effect on Assela 1 and a delay to Assela 2.</p> <p>JC Rating –  Satisfactory – the strong commitment of both EEP and MoFEC to the project and implementation of national policies to increase access to power across Ethiopia make it likely that the project will be successfully implemented.</p>	

JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>The EEP monitoring framework sets out the following outcomes and outputs indicators and targets :</p> <ul style="list-style-type: none"> • Output 1 - Wind farm built including a substation and connection to the national grid -- 100MW • Output 2 - EEP staff have received certified training -- 20 • Output 3 - TA provided creating capacity at the wind farm to secure the operation and maintenance, • Output 4 - Wind farm availability -- 95% to 98% • Outcome 1 - Quantity (GW hours) electricity delivered annually to the national grid from Assela Wind Farm1 - 330 GWH • Outcome 2 - The Government of Ethiopia maintains wind energy as a priority in the country's future energy matrix <p>Although the framework separates outcomes and outputs, the data captured by the outcomes are really outputs. The framework does not in fact capture information on development outcomes such as the targeted beneficiaries of the wind farm Assela or the economic benefits. The overall approach to reporting appears to be focused on verifying that infrastructure delivers the specified engineering and technical outputs and is as reliable as planned. Such compliance with design and contractual specifications means that the end of monitoring is at the final hand-over or project completion.</p> <p>JC Rating –  Partly satisfactory – emphasis is on outputs not on development outcomes</p>	
EQ 10 Overall Rating  Partly satisfactory. Project risks adequately addressed. Development outcomes not addressed in M&E systems, the focus being on wind farm operating to planned specification.	

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
<p>JC 10.2 sets out the monitoring framework. The development logic set out in the project document focuses in quantitative terms on the planned technical and engineering outputs from Assela 1. Development outcomes are addressed in less detail in qualitative terms. In short, it is stated that since the 2016 Ethiopia Growth and Transformation Plan II (GTP II) sets out goals for expanding wind power generation and being less reliant on hydro, Assela 1 being a contributor to this goal is therefore appropriate for the development of the country. Insufficient attention, for example, is given to how increasing access to electricity across Ethiopia will happen and the related expansion of the grid and distribution network; including progress towards 50% access by 2025³⁸. The project document does not include GoE targets and indicators for electrification, particularly in rural areas. At the project level outcome indicators should have included social mitigation measures recommended in the environmental impact assessment, including the provision of electricity to the non-electrified villages in the project area and the provision of job opportunities for the local population.</p> <p>JC Rating –  Partly satisfactory. Insufficient attention to outcomes both for communities in the project area and the wider outcomes to Ethiopia from increase access to electricity across the country.</p>	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>Construction of the Assela 1 Wind Farm is due to begin shortly. As noted above the focus of monitoring framework is on the delivery of the technical and operating outputs. Both outcome and output indicators are monitored up until final handover of the wind farm to EPP at the end of the no defects period when it is fully meeting the defined technical specifications. The two outcome indicators are in fact output related. There are no development outcome indicators that track the benefits to communities in the area around Assela or the overall widening of access to electricity across Ethiopia</p> <p>JC Rating – N/A as project implementation yet to begin</p>	
EQ 11 Overall Rating  Partly satisfactory. Monitoring framework is output focused. Insufficient attention to outcomes both for communities in the project area and the wider outcomes to Ethiopia from increase access to electricity across the country.	

³⁸ World Bank Ethiopia-Country-Partnership 2018-2022 page 2

Images



Assela Project site at Iteya Ethiopia

Case study: Ghana

5 Ghana: Rural Fibre Optic Backbone Link

Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> • Installation of fibre optic cable was relatively easy alongside main eastern corridor highway, despite the long distances involved. • Visited Ho (start of cable) and Bawku (end near border with Burkina Faso. Only Ho was connected. When Bawku will be connected is unclear. • Overall traffic levels on cable very low. Therefore, commercial viability and sustainability poor. • Feasibility study identified government offices and agencies along the 800km route as the major potential users. None have so far been connected because, inter alia, this requires Ministry of Finance permission and funding that is still to be granted. Government users appear to be satisfied with existing arrangements with local private telecom companies • NITA as telecom regulator has not been able to commercialise cable. Low government salary scales have prevented it from attracting private sector managers with the skill to identify and negotiate contracts. • Project design was flawed as it envisaged NITA a regulator to set up and manage a business to commercial exploit the cable. • The Ghanaian company Smart Infracore, signed a contract with NITA in 2020 to manage and commercialise the cable by finding organisations/enterprises to lease capacity. To date no significant users have been identified. • Location of cable next to the main eastern corridor highway has led to a considerable number of cuts of the cable by contractors and developers, most notably the Ghana Highways Authority when carrying out repairs and improvements on the N2 highway as shown in the map below³⁹. 	

Summary														
Project name	Rural Fibre Optic Backbone Link, Data Centre and Managed Services (RRFOBL)													
Type of project	Telecommunications													
Project No.	104.O.30.Ghana													
Description	<p>Prior to the project, Ghana's fibre optic cable infrastructure was primarily operated by Huawei. However, the network was missing a link along the eastern corridor on the border with Togo, which means that access to data communication in these areas is deficient and that the system is not fully redundant. The project is to increase and improve access to data communications, in eastern Ghana (from the southern edge of Lake Volta to the north east corner). including internet and telecommunications, develop state data centres The project will thus also support the specific strategic objective of promoting business development and, in particular, the framework for business activity.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">Project overview</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Hardware:</td> <td rowspan="3">Phase 1: includes laying 580km of 48 core fibre optic cables, purchasing and installing hardware. Planned implementation 15 months.</td> </tr> <tr> <td style="text-align: center;">1.1</td> <td>Design and implementation of fibre optic backbone link (cable infrastructure)</td> </tr> <tr> <td style="text-align: center;">1.2</td> <td>2 data centres and server infrastructure</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Software</td> <td>2 data centres</td> </tr> </tbody> </table>	Project overview			1	Hardware:	Phase 1: includes laying 580km of 48 core fibre optic cables, purchasing and installing hardware. Planned implementation 15 months.	1.1	Design and implementation of fibre optic backbone link (cable infrastructure)	1.2	2 data centres and server infrastructure	2	Software	2 data centres
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2	Software	2 data centres												






³⁹ Also according to an MFA email dated 10 October 2021 to the evaluators: added '...the appraisal report (undertaken by a private consultancy company) is completely silent about the potential risk of cuts. When the Embassy asked the consultant who undertook the appraisal why this risk had not been mentioned and mitigated, he responded that he had never expected this to be a problem. This was despite exactly the same problem being pertinent in another DSIF project in Mozambique undertaken by the same contractor before the project in Ghana. Cuts are not mainly made by "contractors, farmers and developers" as suggested in the study (s. 209), but by the Ministry of Roads and Highways. A simple plan jointly prepared by the two ministries (also Ministry of Communication where the cable project belongs) would go a long way to prevent cuts. The contractor knew all the time that cuts would be a problem without a plan to prevent them, but opted to move fast rather than spend time on ensuring high quality'.

Summary																														
	2.1 Help desk 15 staff 2.2 Performance management and rating system 2.3 E-learning management system 3 System transfer and training 109 days	Phase 2: includes installation of software, system customization, training in operation and maintenance, and system transfer. Planned implementation 2.5 years																												
	<p>The final eastern fibre optical backbone consists of a fibre optical cable (FOC) connected to the existing network in Bawku and Ho., and subsequently to Accra; a total length of 1.010 km. Along its length there are 11 point of presence (POP) centres: Accra, Somanya, Ho, Kpando, Jasikan, Nkwanta, Bimbilla, Yendi, Tamale, Gushegu and Bawku, where it can connect to existing local telecom networks and operators. At present only nine of the 48 cores are being used. 32 of the 48 cores were allocated to Smart Infracore in early 2020 which has a contract to find commercial users.</p> <p>There are three intermediate stations to provide the necessary optical amplification. The FOC will be pulled in cable ducts and buried in the ground in a depth of 1,2 m. The purpose of the eastern FOC is to provide redundancy to the existing backbone network, and to provide future access to the e-government network by Wimax base stations or spurs of fibre links to the end-users. 90% of the traffic on the cable was expected to be by the government and its agencies.</p> <p>In 2018 a €3,8m change order number 45 included:</p> <ul style="list-style-type: none"> the 158km Accra to Ho fibre optic link the 15km Bwaku to Burkina Faso fibre optic link <p>The project was tendered by the Ghanaian government in 2011.</p>																													
Sector	Telecommunications																													
Country	Ghana																													
Sponsor	Ministry of Communication/National Information Technology Agency (NITA)																													
Other stakeholders	Ministry of Finance and Economic Planning is the borrower																													
Clearance in principle																														
Approval/Binding Commitment	21 December 2011, final approval October 2012 Change order 45 signed 17 May 2016	Loan / Investment Agreement Date	Disbursed 29/10/2013 and 23/6/2015																											
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Loan Duration + Grace Period	10 years																													
Project Amount and funding plan	<table border="1"> <thead> <tr> <th><i>Investment budget</i></th> <th><i>Eur m</i></th> <th><i>Dkkm</i></th> </tr> </thead> <tbody> <tr> <td>Fibre optic backbone link</td> <td>7,00</td> <td>52,2</td> </tr> <tr> <td>Data Centre and Server Infrastructure</td> <td>11,25</td> <td>83,7</td> </tr> <tr> <td>Help desk</td> <td>0,50</td> <td>3,7</td> </tr> <tr> <td>Performance management and rating system</td> <td>1,35</td> <td>10,0</td> </tr> <tr> <td>E-learning management system</td> <td>1,45</td> <td>10,8</td> </tr> <tr> <td>System transfer, training and knowledge transfer</td> <td>13,47</td> <td>100,2</td> </tr> <tr> <td>Contingencies (10%)</td> <td>3,50</td> <td>26,1</td> </tr> <tr> <td>Total</td> <td>38,52</td> <td>286,6</td> </tr> </tbody> </table>			<i>Investment budget</i>	<i>Eur m</i>	<i>Dkkm</i>	Fibre optic backbone link	7,00	52,2	Data Centre and Server Infrastructure	11,25	83,7	Help desk	0,50	3,7	Performance management and rating system	1,35	10,0	E-learning management system	1,45	10,8	System transfer, training and knowledge transfer	13,47	100,2	Contingencies (10%)	3,50	26,1	Total	38,52	286,6
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Danish Exporter	Alcatel-Lucent and held up against the evaluation. Alcatel-Lucent has offered by far the best technical solution, while the bid price is well below the other bidders. Alcatel-Lucent wins in all points. Alcatel-Lucent Denmark A/S (now Nokia A/S)																													
	<table border="1"> <thead> <tr> <th><i>No.</i></th> <th><i>Name of tenderer</i></th> <th><i>USDm</i></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Dimension Data</td> <td>65,0</td> </tr> </tbody> </table>			<i>No.</i>	<i>Name of tenderer</i>	<i>USDm</i>	1	Dimension Data	65,0																					
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Summary					
	2	Alcatel-Lucent		49,5	
	3	Huawei		61,4	
MFA guarantee	Date		Amount		Duration
Implementation status	7 January 2013 – 29 February 2016 Change order 45 - The connection Ho-Accra will be carried out by Alcatel-Lucent/Nokia during the second half of 2016 in accordance with a new change order signed with NITA on 17 May 2016.				
Feasibility study details	2012 April Cowi Final Pre-appraisal- Ghana fibre and feasibility study 3 undated				
Subsidy – rationale and key features			Million DKK	Million EUR	
	Interest subsidies:		57,62	7,74	
	EKF premium:		23,96	3,22	
	Bank margin:		2,77	0,37	
	Extra cash gift amount:		27,04	3,63	
	Technical assistance, etc.:		3,00	0,40	
	Budget margin 25%:		28,60	3,84	
Country Context	<p>The period from 2007 to 2011 was characterized by sustained growth of the Ghanaian economy, peaking with a 14% growth in 2011. The growth in this period was largely driven by the oil and gas sector. Together with a rebasing of the country's GDP, this resulted in Ghana advancing from a low-income country to lower middle-income country classification in 2011. Information and Communication Technologies (ICT) infrastructural development in Ghana is progressing comparably to other low-income countries globally and above the 1,1% average for Sub-Saharan Africa. Prominent among these initiatives is the development of a national fibre optic network (VOLTACOM) by the nation's electricity provider, the Volta River Authority (VRA). There have also been major investments in ICT infrastructure from existing Internet Service. In the years leading up to this project there had been a three-fold increase in the number of international fibre optic cables landing in Ghana. This in turn; has resulted in an explosion in the amount of bandwidth available for distribution out of the landing sites in Accra to the rest of the country. This expansion in capacity was accompanied by a 73% decline in wholesale bandwidth costs over 4 years.</p> <p>The lack of connectivity capacity along the Eastern Corridor has contributed to development in the regions lagging behind the rest of the country.</p>				




5.1 Evaluation Questions



EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>This project involved filling in the missing link in a nationwide fibre optic cable network. It covered the 580km eastern corridor near the border with Togo which is rural and underdeveloped. There is good alignment with the following cooperation strategies:</p> <ul style="list-style-type: none"> • <u>Ghana Joint Assistance Strategy (G-JAS)</u>. Commitments by partners (including Denmark) to work toward GPRS II goals and harmonization principles. 2007. Denmark committed to supporting: <ul style="list-style-type: none"> ○ the private sector ○ human development and basic services to enhance the role of education, health and water/sanitation sectors in raising the productive capacity of the population, enabling them to work more effectively in the productive sectors of the economy. • <u>Denmark-Ghana. Partnership Policy 2014-2018</u> the Rural Fibre Optic Backbone Link is compatible with two of the four strategic objectives: (i) Promotion of inclusive and green growth; and (ii) Economic diplomacy and increased commercial operations. It fits with two of the focus areas: (i) commercial opportunities and services, and (ii) private sector development and green growth. <p>Improved access to telecommunications and data communication will contribute to better living conditions in eastern Ghana, while improving business conditions and increasing employment opportunities. While the direct employment will be minor, the indirect employment and income generation is expected to be significant. Indirect beneficiaries are private households and business entities, including other telecommunications operators, in the project areas, which will get access to both improved and new services.</p>	

<p>Apart from the eastern part of Ghana, RRFOBL is a key part of the national fibre optic network in Ghana as it will benefit from its capacity to provide alternative access routes to the internet if other parts of the nationwide network fail. As a result, the national backbone system is more reliable and robust.</p> <p>JC Rating -  Satisfactory – RRFOBL is the final link to expand a fibre optic backbone around Ghana. It directly benefits to the developed eastern region bordering Togo. The project aligns well with MFA development policies and strategy in Ghana.</p>	
<p>JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account</p> <p>The project is sponsored by National Information Technology Agency (NITA) that is part of the Ministry of Communications (MoC). NITA is mandated to :</p> <ul style="list-style-type: none"> • implement Ghana's ICT policies • regulate of the provision of information communications technology • ensure the provision of quality information communications technology. <p>The MoC's mission statement is 'To facilitate the development of a reliable and cost effective will class communications infrastructure and services, driven by appropriate technological innovations to enhance the promotion of economic competitiveness in knowledge-based environment.'</p> <p>Of specific relevance to RFOBL is the <u>Ministry of Communications: National Broadband Policy and Implementation Strategy, October 2012</u>. In section 2.12.1 Broadband and Fibre Optic Backbone Link it is stated: 'The existing National Fibre Backbone, installed by both the public and private sector concerns stretches from the south through the western corridor to the north and back to the south. There is thus a missing loop in the north-eastern part of Ghana. As no private sector concern has shown interest in developing that loop, the proposed expansion of the National Fibre Backbone to be undertaken by government is to complete the loop from the Eastern corridor stretch (Bawku to Ho) and increase bandwidth availability to the general public. furthermore, in Appendix 5 'Additionally there exist the national fibre optic backbone infrastructure which is now being upgraded with the Eastern Corridor Rural Fibre optic connectivity.</p> <p>JC Rating -  Satisfactory – Strong alignment with national development policies, most importantly this project was clearly set out in the 2012 National Broadband Policy and Implementation Strategy</p>	
<p>JC 1.3 Added value of Project Preparation Facility (PPF)</p> <p>JC Rating - Not used</p>	
<p>JC 1.4 Complementarity with development partners operations and strategies</p> <p>A key development partner active in the telecoms sector in Ghana is the World Bank which in 2006 approved support to Ghana in its development of the ICT sector through a USD 40 million facility. This seeks to generate growth and employment by leveraging ICT and public-private partnerships to develop the Information Technologies Enabled Services (ITES) industry; and to support public-private partnerships to improve efficiency and transparency through selected e-Government applications. In 2010 an additional credit for the e-Ghana Project of approx. USD 44 million was approved by the World Bank. The additional funds will be used to:</p> <ul style="list-style-type: none"> • meet the financing gap under the original e-Ghana project components, arising from the modification and restructuring of project activities, and • scale-up project activities to include a GIFMIS (Ghana Integrated Financial Management Information System) component in order to enhance development impact of the project as a whole through further enhancing the accountability and transparency of government financial operations using ICT-based tools. <p>The eastern corridor fibre optic backbone link financed by DSIF provides key physical infrastructure to enable the e-Ghana project to reach all of the country.</p> <p>JC Rating –  Satisfactory – Project is complementary to World Bank e-Ghana project.</p>	
<p>JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts</p> <p>Eastern Ghana is rural and poverty is considerably higher than in Accra. The lack of fibre optic access to the internet put it at a disadvantage and economic development was lagging behind the rest of Ghana which were already connected. Moreover, this final link in the Ghana fibre optic cable network provided redundancy to the system so that outages in one place would not interrupt internet service across the whole network. RRFOBL has potentially high development outcomes and impacts, as noted in the 2012 National Broadband Policy .</p> <p>JC Rating –  Satisfactory – The project clearly meets the criteria for higher development outcomes and impacts.</p>	
<p>EQ 1 Overall Rating –  Satisfactory – DSIF supported an important project that was well aligned with its strategy in Ghana. It was the missing link in roll-out of a countrywide fibre optic network as identified in the 2012 National Broadband Policy .</p>	

<p>EQ 2 -Coherence</p>	<p>To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?</p>
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JC 2.1 Systematic research for coherence with MFA development policies and strategy
<p>Denmark has been providing development assistance to Ghana since it gained independence in 1957. Danida's support for PSD is listed in the Ghana Joint Assistance Strategy (G-JAS). Commitments by partner (including Denmark) to work toward GPRS II goals and harmonization principles. The project complies well with DSIF principles for project selection, most notably as Ghana is a low-middle income focus country, involves the transfer of technology from the Danish arm of an international telecoms equipment supplier. The focus of RFOBL on the rural eastern region which was the last to be connected to the National Fibre Backbone. Government services and the private sector will benefit from fast reliable internet access and services helping to bring about faster economic development and poverty reduction.</p> <p>At a national level, with a full circular network of FOCs that will be less vulnerable to outages as there will be for the first time redundancy built into the network. As a result, the backbone system is more reliable and robust, enabling there to be a greater contribution to development arising from internet access.</p> <p>As 90% of the planned use of the RFOBL is forecast to be by the public sector the project is not commercially viable.</p> <p>Moreover, it fits well with Denmark's 2017 development strategy "The World 2030" for poor and more stable countries, with a focus on gradually shifting from development cooperation to increased political and commercial cooperation.</p> <p>JC Rating -  Satisfactory – the fibre optic backbone linkage is a high development outcome/impact project that will primarily benefit the rural eastern part of Ghana, which is a Danida and DSIF focus country</p>
JC 2.2 Synergies /complementarity with other Danish development initiatives
<p>There are no other specifically compatible Danida or IFU projects in Ghana. RFOBL is, however, with the Danida's overall policy and approach in Ghana.</p> <p>JC Rating -  Satisfactory – Compatible in general with Danida's overall policy and approach in Ghana.</p>
JC 2.3 Danish business links with beneficiary countries
<p>The Danish arm of Alcatel-Lucent (now Nokia Denmark) won the tender for RFOBL in 2011 organised by NITA. It was the lowest bidder being about 20% below that of second placed Huawei. It was also judged to have offered to best technical proposal, as was confirmed during the field visit. Nokia Denmark has a turnover of about €50m and 140 employees.</p> <p>JC Rating -  Satisfactory The project was implemented by Alcatel Lucent Denmark which won the international tender on both technical and price quality.</p>
EQ 2 Overall Rating -  Satisfactory – The project aligned well to Danish policies and country strategy. The fibre optic backbone linkage is a high development outcome/impact project that will primarily benefit the rural eastern part of Ghana, which is a Danida and DSIF focus country. The Danish equipment supplier is part of the international Nokia telecoms group.

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	<p>There is no information on whether funding was available from other sources. The financial analysis set out in the appraisal report shows that the project is not financially sustainable on commercial loan terms in large part because the revenue assumptions are based on approximately 90% governmental data traffic, i.e. ministries, departments, agencies, etc. and approximately 10% from private operators. There was therefore a need for concessional funding.</p> <p>JC Rating -  Satisfactory. It is not known whether the project could have been funded from other sources. It is though clear that RFOBL was not commercially viable as 90% of forecast traffic would be generated by the public sector.</p>
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	<p>Although little non-financial additionality this is because project was managed by the NITA. Moreover, ESG effects were assessed to be minor.</p> <p>JC Rating -  – Partly Satisfactory:</p>
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	<p>No other funding mobilised.</p> <p>JC Rating - Not applicable.</p>
EQ 5 Overall Rating –  Satisfactory	It is not known whether the project could have been funded from other sources. It is though clear that RFOBL was not commercially viable as 90% of forecast traffic would be generated by the public sector.

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
<p>Implementation took place over 3,5 years from 2013 to 2016. The cable was extended from Ho to Accra, resulting in a total length of 1.010km. While the actual fibre optic cable is in the ground, the field visit found that the Bawku point of presence centre (which allows local connections to cable) was not working. Moreover, the relatively shallow 1,5m trench along the main N2 highway in eastern Ghana where the cable is laid has resulted in frequent cuts by contractors, farmers and developers. As a result, the infrastructure is not fully operational and subject to outages.</p>	
<p>JC Rating –  – Partly Satisfactory: Not fully operational and subject to cuts in the cable reducing reliability.</p>	
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
<p>The economic analysis in the AR identified the following expected outcomes in eastern Ghana:</p> <ul style="list-style-type: none"> • As the predominant user of RFOBL, better provision of public services. • Increased data and telecommunications traffic including an expansion of services from private telecom companies. • Regional enterprises will expand more rapidly and profitably, thereby, inter alia, increasing employment. • Improved education <p>Overall, it was expected that over time there would be enhanced/improved standard of living in eastern Ghana along the route of the cable. Across Ghana the built-in redundancy that completion of the National Fibre Backbone would bring in more reliable access across to internet services across the country, especially in the rural central and northern regions. There was also planned to be capacity building at NITA to operate the ICT infrastructure in an efficient and sustainable way.</p> <p>In practice the actual implementation of the project was relatively simple technically in terms of laying the cables (which were buried in trenches next to major highways) and building the data centres, although these data centres were much later than planned to come into operation. The extension to Accra was finished in 2018. There have, however, been three major challenges:</p> <ol style="list-style-type: none"> 1. The frequency with which the cable has been cut. According to a 2016 verification report, 96 times alone in 2015⁴⁰. 2. The low level of data traffic on the Eastern Corridor fibre cable⁴¹. In 2018 the verification consultant for the change order commented that five years after completion: ‘...the general impressions from discussions with different stakeholders, it is the opinion of the Consultant that the current utilisation of the Eastern Corridor is very low, and that the potential of the system is yet to be acknowledged by NITA and the Ministry of Communication.’ The field visit, which included visits to the points of presence in Ho (original starting point near the southern end of Lake Volta) and Bawku (in the north east near the borders with Burkina Faso and Togo) found that only the Ho POP was working. Moreover, the planned use by government offices and agencies in towns along the 1.010 km length has yet to happen. 3. Efforts by NITA to lease out capacity on the 48-core cable to private telecom operators and other users have not been successful. A Ghanaian/Indian consortium was contracted in 2020 to maintain and commercialise the cable, although to date no leases have been signed. <p>Consequently, it is only possible to say that the physical infrastructure has been built but that the low levels of utilisation mean that there is no information on identifiable and measurable outcomes. Keeping the RFOBL in working order and rapidly repairing breaks when they occur is crucial.</p> <p>JC Rating -  – Unsatisfactory: Traffic volumes have been low mainly because government agencies and offices (the planned dominant users) have not been connected. At present it is difficult to see when planned development outcomes may materialise.</p>	
JC 6.3 Environmental, social and governance (ESG) risk management	

⁴⁰ According to Cowi the verification consultant: ‘There is no centralised system to share information about buried services i.e. contractors working in areas with fibre optic cables have no knowledge of the existing services in the ground. NITA has not implemented recurring route patrolling. With proper route patrolling any contractors working in the vicinity of the cables could be notified in due cause before they make damages to the fibre optic cables.’

⁴¹ Cowi - May 2018 - National Information Technology Agency / DBF: Rural Fibre Optic Backbone Link, Data Centre and Managed Services – verification upon taking-over - Ch045


The environmental effect of laying thin fibre optic cables in trenches next to highways on public land⁴² and building data centres and other associated infrastructure were foreseen to be limited and modest. The Environmental Protection Agency in Ghana did not require the preparation of an EIA. No significant environmental issues have been identified. The following permits and certificates were necessary:

- EPA certificate
- Road and Highways (RH) Permit
- Metropolitan Authority (MA) Permit
- Atomic Energy Commission (AEC) Certificate

The project does not have any specific provisions to enhance the participation of women. NITA is trying to recruit more women to improve the gender balance.


A sensitive construction issue that arose that was identified by the Danish embassy in Ghana in 2017⁴³ was: '... that a subcontractor to NOKIA in the project used prisoners for the work of laying the cables. The use of prisoners was stopped immediately. ...It is recommended that NOKIA's management be summoned to a meeting at the Ministry of Foreign Affairs and made clear that what happened is completely unacceptable, and that the case is thus closed.'

While the use of prison labour should not have occurred during construction, it was stopped and did not affect the actual day-to-day operation of the cable which was installed as planned.

JC Rating -  Satisfactory There are no significant environmental issues resulting from having thin fibre optic cables in trenches next to highways on public land and building data centres and other associated infrastructure were foreseen to be minor. The prison labour issue that was identified and resolved by the Ghana Embassy was a construction issue and did not affect the operation of the cable so that there were no adverse ESG consequences on operations.


JC 6.4 Contribution to climate change mitigation, green and inclusive development


Like most telecoms projects RFOBL does not have any significant adverse consequences for the climate. In operation the main resource used is electricity which mostly comes from hydropower plants on Lake Volta.

JC Rating -  Satisfactory – No adverse climate effects.

JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

RFOBL is compatible with the HP as it is low carbon and climate resilient.

JC Rating -  Satisfactory RFOBL is compatible with the HP as it is low carbon and climate resilient.

EQ 6 Overall Rating  – Unsatisfactory: Traffic volumes have been low mainly because government agencies and offices (the planned dominant users) have not been connected. At present it is difficult to see when planned development outcomes may materialise. Also, not all of the cable is operational (Bawku POP in the north east is not working) and there are frequent cuts of the cable by contractors. No adverse environmental effects during construction or operation of the fibre optic backbone linkage.

EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
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JC 7.1 Satisfactory development outcomes(using DAC definition of impact)





The following indicators were presented in the AR. in the context of appraisal and reflect the current indicators under DB Finance.

Output

Component	Current situation	Expected target
Fiber optic cable	0 km. fibre optic cable installed along the Eastern Corridor	580 km. fibre optic cable installed along the Eastern Corridor and connected to the total fibre cable network
Datacentres	A smaller existing data centre	Two data centres and server infrastructure installed and connected
Help desk	No help desk /service business exists	Help desk with 15 employees established and in full operation
Performance management and rating system	No system exists	Software platform installed and in full operation


⁴² In Ghana the 'road reserve' extends for a specified distance (maybe 25m) of the centre line of the road (this will vary with the class of road). Within that reserve the land is 'owned' by the highway authority and no acquisition of land is required.

⁴³ Memo from Ambassador to Minister 25 April 2017

e-Learning System	No system exists	e-Learning platform installed and in operation
System transfer and training	NITA employees have circular knowledge of data networks	109 training days completed and NITA staff are able to operate and maintain the systems
Outcomes		
<ul style="list-style-type: none"> • Eastern cable line is in full operation and has an uptime of over 95 per cent. • Capacity utilisation of the cable line of more than 35%. • NITA is fully capable of operating and maintaining the systems <p>The output indicators are as appropriate they are limited. There are no technical indicators relating to the actual FOC capacity such as the number of gigabytes of data per second that can be carried, usage by private telecom companies etc. The outcome indicators are in fact also general output indicators.</p> <p>There are no DAC compliant outcome targets and indicators, such as (i) traffic volumes on the RFOBL, (ii) internet connections using fibre rather mobile phone, (iii) usage of fibre linked internet in government offices in the eastern region, and (iv) reliability statistics for whole national backbone system to assess contribution of eastern corridor loop.</p> <p>It is therefore only possible to say that construction of the RFOBL and extension to Accra was completed and handed over to NITA. No information on development outcomes is available.</p> <p>JC Rating -  – Unsatisfactory: Traffic volumes have been low mainly because government agencies and offices (the planned dominant users) have not been connected. At present it is difficult to see when planned development outcomes may materialise. It is only possible to say that construction of the RFOBL and extension to Accra was completed and handed over to NITA. No appropriate outcome indicators defined.</p>		
JC 7.2 Strong ESG performance of DSIF projects		
<p>There are no significant environmental issues resulting from the laying thin fibre optic cables in trenches next to highways on public land and building data centres and other associated infrastructure were foreseen to be limited and modest.</p> <p>JC Rating -  Satisfactory There are no significant environmental issues to be managed.</p>		
JC 7.3 Satisfactory financial returns and portfolio performance		
<p>The AR financial analysis showed that if funded on commercial terms, the cash flow for the entire investment period will be negative but positive if funded by DSIF. The revenue assumptions are based on approximately 90% governmental data traffic, i.e. ministries, departments, agencies, etc. and approximately 10% from private operators. The DSIF verification consultant commented in the 2018 handover report for the Accra Ho extension that anecdotal evidence was that traffic volumes were still very low, two years after the main FBOL was completed. A problem identified in 2016 was that it had been difficult to attract private telecom users. The 2021 Particip field visit to Ho and Bawku, as well as meetings with NITA, confirmed that the situation has changed little. Government offices and agencies are not connected to the cable. A significant user is, however, the University of Health and Allied Sciences in Ho. Moreover, the Bawku POP is not working. Smart Infracore, a Ghanaian IT company working with Tata Communications Transformation Services of India, was hired in 2020 to maintain and commercialise the cable. To date no new cable use leases have been signed.</p> <p>JC Rating -  – Unsatisfactory The field visit found that while traffic volumes have improved, they remain low, due in large part to the planned utilisation by government offices and agencies that is still to occur.</p>		
EQ 7 Overall Rating -  – Unsatisfactory: Poorly defined development outcome indicators and low traffic volumes on the RFOBL indicate that neither sustainable development nor satisfactory financial returns have been achieved.		

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>The AR listed a number of economic benefits that the fibre optic backbone link in eastern Ghana would deliver including:</p> <ul style="list-style-type: none"> • Improved public services. Citizen can access the government portal for information on health, economic empowerment, linkages to NGO's and other organizations and also online access to government services. • High speed internet access that the 10 major internet service providers (ISPs) would be able to offer to businesses and households. These ISPs were expected to be significant customers for NITA on the RFOBL. • Improved quality of life to the population through access to the world wide web. • The project is part of the national backbone system and is a cornerstone in the GoG's poverty reduction programme and it is expected that the universal access of telecommunication services will facilitate in reducing illiteracy and generating jobs throughout the country. 	

Given the slow build-up of traffic on the RFOBL, it is not possible to identify these anticipated economic and social benefits. More importantly, however, six years after its installation the cable and associated equipment is not being used by government offices and agencies in eastern Ghana that were expected to account for 90% of traffic. Particip learnt during the field visit that government departments can only sign contracts to use the cable with the permission from, and funding by, the Ministry of Finance, which is yet to happen. Furthermore, Smart Infraco which was hired in 2020 to commercialise the cable has yet to sign contracts with other users. Consequently, cable traffic volumes remain low. The field visit also found that not all of the 1.010km cable is in operation. Specifically, the Bawku POP at the northern end is not working.


JC Rating -  – Unsatisfactory – low traffic volumes and no connections to government offices and agencies six years after completion raise serious concerns about the economic viability.

JC 8.2 Level of commercial/financial viability of infrastructure

The following issues influencing commercial/financial viability arose after the cable, data centres and other equipment were installed:

- Low traffic volumes due primarily to the lack of connections to government offices and agencies along the route that were expected to account for 90% of the usage. The field visit found that there has been no substantial change in the situation described in the May 2018, verification report by the DSIF monitoring consultant: ‘...based on the general impressions from discussions with different stakeholders, it is the opinion of the Consultant that the current utilisation of the Eastern Corridor is very low, and that the potential of the system is yet to be acknowledged by NITA and the Ministry of Communication.’ As noted, in 2020 Smart Infraco was contracted to maintain and commercialise the cable, although to date no private ISPs have been connected.
- Poor reliability of the cable to due to frequent cuts caused by contractors.
- High access fees to use the privately operated 160 km between Ho and Accra that was necessary to connect the cable to NITA’s headquarters. To avoid such fees, DSIF funded an extension to the link DSIF also agreed to fund Alcatel to operate the link while NITA strengthened its in-house capacity to manage the link. Alcatel would also construct the €3.8m extension.

In summary, the commercial/financial viability of RFOBL was uncertain. It was unclear whether NITA/Ministry of Communication would be able to implement the original strategy of having ministries and agencies in the eastern region to move onto the link and expand the public services they were mandated to provide. Also, it was unclear how NITA would attract private internet service providers (ISPs) onto the RFOBL cable.


JC Rating -  – Unsatisfactory: The outlook for the commercial and financial viability of the RFOBL remains uncertain with low traffic volumes and no clear plans as to how to increase usage other than the possibility of government offices and agencies being connected and/or private ISPs being connected.


JC 8.3 Level of improvements in ESG achievement

There are no significant environmental issues to be managed.

Nevertheless, during project implementation a sensitive social issue was identified by the Danish embassy in Ghana in 2017⁴⁴. It had learnt: ‘... that a subcontractor to NOKIA in the project used prisoners for the work of laying the cables. The use of prisoners was stopped immediately. ...It is recommended that NOKIA’s management be summoned to a meeting at the Ministry of Foreign Affairs and made clear that what happened is completely unacceptable, and that the case is thus closed.’

While the use of prison labour should not have occurred during construction, it was stopped and did not have any impact on the actual day-to-day operation of the cable. For the purpose of the evaluation the rating of ESG achievement relates to whether in operation the cable has any adverse ESG effects; does it, for example, pollute the environment or harm local communities along its route? The field visit found that the cable, which is buried 1.5m below the surface in a trench next to the main N2 highway is invisible and does no negative impacts on local communities and the environment. In short the project is environmentally sustainable as defined by OECD DAC⁴⁵.

JC Rating -  Satisfactory There are no significant environmental issues to be managed and the project is environmentally sustainable.

EQ 8 Overall Rating -  – Unsatisfactory: A lack of traffic on RFOBL due to a failure to get government ministries and ISPs to use it makes its economic and financial viability uncertain. Currently, there are no clear plans to increasing traffic. Sustainability at present is therefore poor.

<p>EQ 10 Project risk management of DSIF</p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
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⁴⁴ Memo from Ambassador to Minister 25 April 2017

⁴⁵ OECD DAC Network on Development Evaluation - Summary of Key Norms and Standards

JC 10.1 Quality of risk management systems and policies on long-term sustainability

The appraisal raised the following risks, none of which was judged significant.


- Technical risk elements include the risk of technological change or the inappropriateness of technical sub-details of the offer. However, this risk has been taken into account by budgeting for contingencies. This budget line is included based on a specific requirement under DB Finance.
- Organisational risk elements include the ability to attract staff and necessary skills, as well as the retention of key personnel. In addition, it is necessary to successfully implement the restructuring of NITA. However, the risk of this is considered small as the organisation is given high priority by the government and restructuring is carried out in cooperation with a consultancy firm with extensive experience of this type of process.
- Operational risk elements include the risk of non-use of funds for maintenance, reinvestment and operations and not enough funds to cover them internally. The risk of this happening is considered small, as the project is very high priority and state institutions will depend on stable operation. Over the last few years, it has been greatly expanded and added more resources.

It turned out that building capacity at NITA to take over management of RFOBL has been a continuing problem as was clear at the time of hand over in 2016 when Alcatel was asked to continue operating the link.

There were, however, two risks that were not taken into account and which have caused major difficulty in getting RFOBL into operation and building up traffic volumes:

- Attracting users, most importantly government ministries (expected to account for 90% of traffic) that preferred to stay with private telecom operators.
- High incidences of the fibre optic cable being cut, usually inadvertently by builders and contractors. It is unclear whether NITA has been able to reduce such cuts.

Another risk that was not included was the use of prison labour, something that probably could not have been anticipated. As noted in JC8.3, when the Ghana Embassy became aware of this it acted swiftly and firmly to have this stopped.

JC Rating –  – Partly Satisfactory: The key risks of attracting users to RFOBL and the high number of cuts of the cable were not anticipated at appraisal.

JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

The following indicators set out in the appraisal have been established in the context of appraisal and reflect the current indicators under DB Finance. In the context of project design, the final scope of the project will be defined, setting indicator targets.

Output


Component	Current situation	Expected target
Fiber optic cable	0 km. fibre optic cable installed along the Eastern Corridor	580 km. fibre optic cable installed along the Eastern Corridor and connected to the total fibre cable network
Datacentres	A smaller existing data centre	Two data centres and server infrastructure installed and connected
Help desk	No help desk /service business exists	Help desk with 15 employees established and in full operation
Performance management and rating system	No system exists	Software platform installed and in full operation
e-Learning System	No system exists	e-Learning platform installed and in operation
System transfer and training	NITA employees have circular knowledge of data networks	109 training days completed and NITA staff are able to operate and maintain the systems


Outcome

- Eastern cable line is in full operation and has an uptime of over 95 per cent.
- Capacity utilisation of the cable line of more than 35%.
- NITA is fully capable of operating and maintaining the systems

The output indicators are as appropriate they are limited. There are no technical indicators relating to the actual FOC capacity such as the number of gigabytes of data per second that can be carried, usage by private telecom companies etc. The outcome indicators are in fact also general output indicators.

There are no DAC compliant outcome targets and indicators that could provide accurate and timely information for management of results at RFOBL. Consequently, it is difficult to assess what development outcomes there have been and whether they are appropriate.


JC Rating – -  – Unsatisfactory The indicators in the appraisal only relate to general, generic outputs and are not well defined. There are no DAC compliant outcome targets and indicators that could provide accurate and timely information for management of results at RFOBL. Consequently, it is difficult to assess what development outcomes there have been and whether they are appropriate.

EQ 10 Overall Rating -  – Partly Satisfactory: The key risks of attracting users to RFOBL and the high number of cuts of the cable were not anticipated at appraisal. There are no DAC compliant outcome targets and indicators that could provide accurate and timely information for management of results at RFOBL. Consequently, it is difficult to assess what development outcomes there have been and whether they are appropriate.

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
---------------------------------------	---


JC 11.1 Quality and appropriateness of RMS


The articulation of the overall development logic is reasonable in general terms. However, no appropriate development outcomes targets and indicators are defined. No suitable theory of change articulated.

JC Rating –  – Partly Satisfactory: The articulation of the overall development logic is reasonable in general terms. However, no appropriate development outcomes targets and indicators are defined.

JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

There are no DAC compliant outcome targets and indicators that could provide accurate and timely information for management of results at RFOBL. Consequently, it is difficult to assess what development outcomes there have been and whether they were appropriate.

JC Rating –  – Unsatisfactory There are no DAC compliant outcome targets and indicators that could provide accurate and timely information for management of results at RFOBL.

EQ 11 Overall Rating -  – Unsatisfactory There are no DAC compliant outcome targets and indicators that could provide accurate and timely information for management of results at RFOBL The specified indicators do not generate reliable data on outcomes of the link.

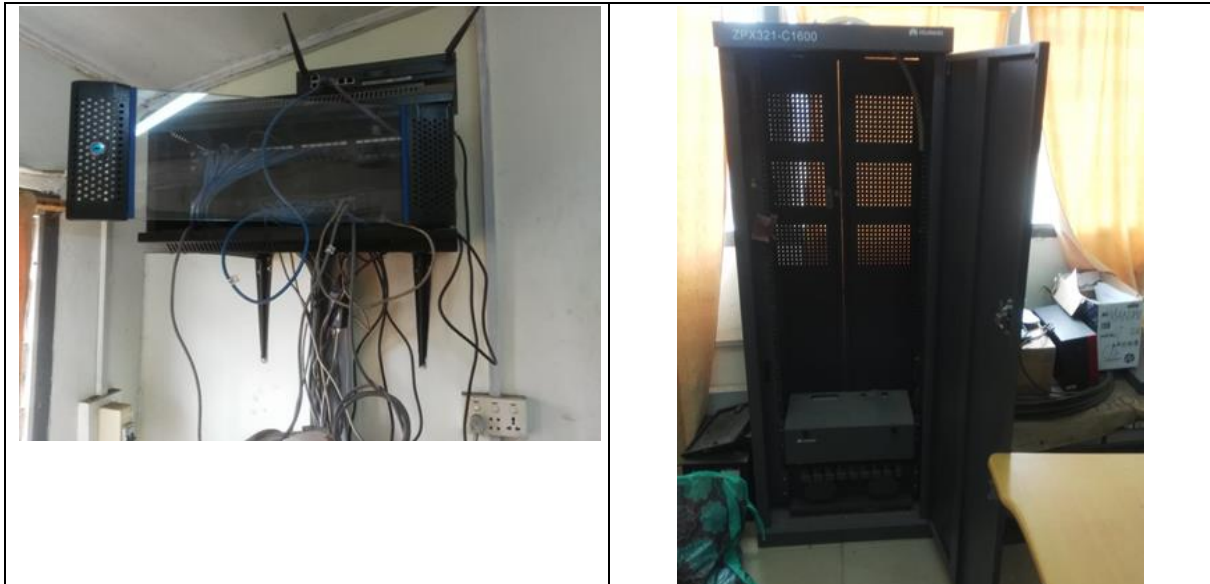
Field visits and calls



Route of Eastern Corridor Ho to Bawku fibre optic backlink

5.1.1 Field visit photographs:

Point of Presence Centre at Ho Municipal Assembly



Bawku POP centre housed at the Bawku Municipal Library – not in operation currently



5.1.2 Eastern Corridor Fibre Optic Project: Field Visit Report March – May 2021

5.1.2.1 Key Findings:

- Installation of fibre optic cable was relatively easy alongside main eastern corridor highway, despite the long distances involved.
- Visited Ho (start of cable) and Bawku (end near border with Burkina Faso). Only Ho was connected. When Bawku will be connected is unclear.
- Overall traffic levels on cable very low.
- Feasibility study identified government offices and agencies along the 800km route as the major potential users. None have so far been connected because, inter alia, this requires Ministry of Finance permission and funding that is still to be granted. Government users appear to be satisfied with existing arrangements with local private telecom companies
- NITA as telecom regulator has not been able to commercialise cable. Low government salary scales have prevented it from attracting private sector managers with the skill to identify and negotiate contracts.
- Project design was flawed as it envisaged NITA a regulator to set up and manage a business to commercial exploit the cable.
- The Ghanaian company Smart Infracore, signed a contract with NITA in 2020 to commercialise the cable by finding organisations/enterprises to lease capacity.
- Location of cable next to the main eastern corridor highway has led to a considerable number of cuts of the cable by contractors.

5.1.2.2 Interview with Mr. Solomon Richardson, Technical Head, National Information Communication Agency (Nita) At 10.30 Am At Nita Office – 19th March 2021

Outputs of Project Components

- Data Centre Component
 - Two data centres available throughout Ghana, Accra and Kumasi
 - Data centres existed before DSIF Project commenced
 - Data centres have servers, storage facilities and secondary solutions
 - All other centres are just POPs – Points of Presence where fibre optic cable connected to local telecom network.
 - POPS are one room facility in District Assembly Offices that are locked and only accessed by NITA relevant staff in Accra.
 - Thus, there are no NITA staff outside Accra and Kumasi
 - Under the DSIF are 11 POP Centres: Accra, Somanya, Ho, Kpando, Jasikan, Nkwanta, Bimbilla, Yendi, Tamale, Gushegu and Bawku.
 - Extension is being made to Kulungugu to cater for potential clients in Burkina Faso.
- Fibre Component
 - Cable is 1.010 km from Accra to Bawku in a 1,4m deep trench next to main highways.
 - These cables total length are linked to POPs.
- Managed Service Component
 - Service was managed by Alcatel for five years.
 - NITA has had capacity building to take over from Alcatel.
 - NITA has entered into a commercial contract with SMART INFRACO to commercialize unused 16 pairs (32 Cores) of fibre cables.
- LMS – Learning Management System Component
 - Some NITA staff trained.
 - On job training of NITA staff during the 5 years management contract with Alcatel (technology and knowledge transfer).
- Performance & Rating Platform Component
 - No available information.

Some Challenges with the DSIF the Fibre Optic Project

- Cables are still been cut through by contractors and developers as the cable is in a shallow trench next to highways that pass through major towns in eastern Ghana.
- GHA are the major culprits although they have been furnished with as built drawings showing where cable is.
- Thus, there are of huge maintenance costs which has necessitated NITA to enter into a commercial contract with SMART Infraco.
- Traffic volumes are low but increasing with the coming in of the commercial partner.

Some Improved Measures and/or Actualised Outcomes

- All Ministries, Departments and Agencies in Ho Municipality are now on Board utilizing 2 pairs (4 cores) out of the total 24 Pairs (48 Cores). (Note – this does not seem consistent with what is happening in Ho based on visit to the municipality building where POP is located by Particip see 4.0)
- MTN is now on board using one pair (2 Cores).
- NITA is currently using 6 Pairs (12 Core).
- The remaining 16 Pairs (32 Cores) has been given to strategic partner SMART INFRACO since early 2020, to commercialize service.
- Vodafone is preparing to come on board soon.
- Comsys a Ghanaian company is on board
- Bluetown, a Danish company is on board providing WI -FI services in Somanya
- FOBC has been extended from Bawku to Kulungugu to enable some companies in Burkina Faso to access the facility. At present, however, Bawku is shut down but to be rectified soon.

(Note Particip visit to municipality building in Bawku where POP is located confirmed that it was not in service see 2.0)

- Revenue generation has greatly improved, although no documents on actual traffic were provided.
- Smart Infraco has rectified all the cut sections from Accra to Nkwanta

Additional Information Requested from Solomon Richardson but not Provided

- Obligations of both parties under the NITA SMART INFRACO (Joint venture of TATA India and a Ghanaian Company)
- Date of signing commercial Contract
- List of stakeholders / beneficiaries to be Interviewed in HO
- List of all government agencies and private companies or operators in Ho actually connected to and using fibre optic cable through POPs.
- Revenue data.

5.1.2.3 Inspection of Pop Centre at Bawku Municipal - Assembly on 25th March 2021

- Bawku is in NE Ghana not far from the border with Burkina Faso and Togo. It was the planned end of the cable, although an extension to the Burkina Faso border is planned to link it to cables there.
- Most Municipal Assembly officials who were not aware of such facility
- The Municipal Engineer Mr. George Anaaba was not aware of a POP centre
- The Municipal IT Specialist, Mr. Ebo William (Contact Number 0244 427 458) was not also aware of the location of the POP centre nor even heard about it.
- Solomon Richardson, technical head of NITA Accra could not also direct us to the location since he had never been there. He made a call to one Mr. Reinhold in the NITA Tamale office who informed us POP centre was located in the Municipal Library
- The Library in which the POP centre is housed is in a poor state that is not suitable for a POP that requires, inter alia, air conditioning and a standby generator.
- The facility is currently not functioning. It has a standby generator at the back of the building.
- The Librarian Mr. Micah Abbey Aguur (Contact Number 0243 664901) indicated that some NITA staff came around quarterly to open the POP centre for regular maintenance.

5.1.2.4 Interview with Mr Agyemeng Ababio, Technical Staff of Nita Head Office Accra

- Apparently, he is a subordinate to Mr. Solomon Richardson
- Enquired why the Municipal Assembly is not using their facilities and he said the Agencies prefer the MTN and the Vodafone Services.
- Asked if NITA has engaged the Municipal Assembly to find out why they are not using the facility. He said it is higher authorities in NITA who can answer this question.

5.1.2.5 Interview with the Public Relations Officer of the Ho Municipal Assembly, Mr Emmanuel Alorse

- Ho was the original start of the cable. However, to increase autonomy the cable was extended 160km south west to NITA HQ in Accra.
- He was aware of the Fibre Optic Project
- POP centres have been established at the Ho Municipal Assembly and also the Volta Regional Administration
- Usage of NITA facility -: The Municipal assembly does not have access to the NITA facility but not aware if the Volta Regional Administration and private users have access
- They are still using MTN and Vodafone
- NITA originally gave them access but cut it off with the explanation of determining payment rates for use of facilities before reconnecting. They never heard of NITA again on this matter
- There was no stakeholder engagement before construction and there was a very serious confrontation when trenches were being dug because he claims they were destroying the road and other facilities

- This May be the reason why there are frequent Cutting of the cables: Absence of Stakeholder Consultations and engagement to bring all to a common ground. There is no sense of ownership by stakeholders
- It appears that NITA did not do a good work

5.1.2.6 Skype Call - Kwaku Kyei Ofori, Nita Deputy Director General 5 May 2021

KKO is number two at NITA. The call was to follow upon findings from previous NITA meetings and the field trip that included stops at the two Points of Presence at the municipality assemble buildings in Ho and Bawku - the original start and finish sites of the fibre optic cable.

- At present traffic on the cable is low. One notable user is the state University of Health and Allied Sciences (UHAS) established in 2012 that has its main campus in Ho.
- The Ghanaian company Smart Infraco, with its partner Tata Communications Transformation Services of India ,signed a contract with NITA in 2020 to commercialise the cable by finding organisations/enterprises to lease capacity. According to its website⁴⁶ 'In Ghana, Smart Infraco is partnering the Ministry of Communications and the National Information Technology Agency to operate a world-class, secure digital infrastructure owned by the government as well as commercialise excess capacity to Ministries, Departments and Agencies (MDAs), internet service providers (ISPs), mobile and private network operators.'
- Apart from UHAS, no leases have to date been signed.
- If all Government offices and agencies along the eastern corridor were connected then around 50% of the capacity might be used. A problem yet to be resolves, however, is that such offices and agencies require permission from the Ministry of Finance and funding to pay for access to the cable. It is unclear when they might be connected.
- Cuts to the cable are still occurring although less frequently. Repairs require a trained maintenance team from Accra with specialised tools and equipment to travel to the site of the break. The most northern parts of the cable are around 1.000 km from Accra requiring a journey of at least 12 hours by road.
- The Bawku POP is not working although there are plans to bring it into service, although when is unclear.
- Only when Bawku is connected will it be possible to consider extending the cable to the border with Burkina Faso and connecting it to BF's internet. This would be the first connection to the submarine cable that has been laid along the coast of west Africa.

⁴⁶ <https://ascenddigitalsol.com/smart-infraco/>

6 Ghana: Bridges in Northern Ghana

Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> • MRH/GHA approached Danida for this project following support given to repair bridges in the north damaged as a result of spillway of the Burkina Faso Bagre Dam on the White Volta, 70 km north of the border with NE Ghana. • Satisfaction with speed and quality of DSIF response for finance. • Hand-over of projects at the end of March 2021. DSIF consultant was at handover. • Field inspection of Kulun and Ambala bridges • GHA representatives were generally satisfied with the quality and workmanship of the contractor for the two bridges and approach roads: Kulun and Ambalara • Development benefits: shorter travel times, stimulus to traffic volumes, Danish contractor provided social infrastructure to local communities such as boreholes, school building (under construction). • Field inspection of Kulungugu and Garu 1 & 2 bridges: <ul style="list-style-type: none"> ○ GHA insisted that environmental and safety issues need to be tackled before taking over of the bridges. Invisble culvert headwalls, steep unprotected slopes could be washed off due to the nature of the rainstorms in that area and this will cut off the road defeating the purpose of accessibility. ○ GHA generally satisfied with the quality and workmanship of the construction for the bridges and approach roads ○ Kulungugu is a national /international route with cargo trucks and passengers' moving through border to and from Ghana to Burkina Faso, Togo and Niger. ○ Development benefits: <ul style="list-style-type: none"> ▪ Easier access to Sandema Hospital, Schools, and other socio - economic facilities. ▪ Easier access to Wa, the regional capital of the Upper West Region during the rainy season for subsistence farmers (maize, beans, rice, cassava, groundnuts and yams) in communities near to bridges. • Expected higher traffic volumes increased in Funsu area. • Overdesign of Doninga Bridge led to a €6million cost overrun . • While 20km of feeder roads were repaired, other access roads to bridges remain in poor condition. • Routes using new bridges are not always the most direct. For example, using the new bridge route, from Garu to Walewale is 99K miles. However, an existing route is much shorter at 68 miles. • Before the new bridge in Kulungugu the nearby border crossing with Burkina Faso could be cut off for days when there was heavy rainfall. The new bridge should ensure that the significant border traffic is not interrupted. 	




Summary	
Project name	Road Bridges in Northern Ghana
Type of project	Transport
Project No.	104.O.30.Ghana.5
Description	<p>In 2010, following the release of the spillway of the Burkina Faso Bagre Dam, parts of the Northern Ghana were flooded and some existing bridges were damaged. Danida assisted in repairing some of these damaged bridges. Following this support, Ghana Highway Authority (GHA – which is an agency of the Ministry of Roads and Highways) and Ministry of Finance (the borrower) sought the Assistance of DSIF for the 7 Northern Bridges.</p> <p>The project involves the construction of 7 new bridges in the Upper West Region and Upper East Region in the northern part of Ghana to replace existing damaged or destroyed bridges.</p> <p>As shown on the maps below, seven bridges were constructed:</p> <ul style="list-style-type: none"> • construction of three bridges to replace the above-mentioned damaged bridges in north-east Ghana on the main N2 highway that goes to Burkina Faso – <ul style="list-style-type: none"> ○ Kulungugu ○ Garu 1 ○ Garu 2– • construction of four new bridges in connection with the road network in north central and north-west Ghana – <ul style="list-style-type: none"> ○ Doninga, ○ Sisili,

Summary																																						
	<ul style="list-style-type: none"> ○ Kulun ○ Ambalara. <p>In addition, the project includes:</p> <ul style="list-style-type: none"> ● Including 20 km of road and bridge approaches ● Training of GHA staff and transfer of knowledge <p>Handover of the bridges took place at the end of March 2021. A Particip consultant attended the handover and visited all the bridges in the North East and North West regions. The field visit report is attached after the EQs.</p>																																					
Sector	Transport																																					
Country	Ghana																																					
Sponsor	In the transport sector, two ministries the Ministry of Transport and the Ministry of Roads and Highways (MRH). Ghana Highway Authority																																					
Other stakeholders	Ministry of Finance and Economic Planning																																					
Clearance in principle	July 2008 pre app																																					
Approval/Binding Commitment	28 October 2010,	Loan / Investment Agreement Date	August 2018																																			
Danish Bank	Danske Bank																																					
Loan Duration + Grace Period	10 years repayments start June 2021																																					
Project Amount and funding plan	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;"><i>Bridge location</i></th> <th colspan="3" style="text-align: center;"><i>US dollars m</i></th> </tr> <tr> <th style="text-align: center;"><i>Bridge construction</i></th> <th style="text-align: center;"><i>Access roads</i></th> <th style="text-align: center;"><i>Total</i></th> </tr> </thead> <tbody> <tr> <td>Kulungugu-Garu</td> <td style="text-align: right;">12,0</td> <td style="text-align: right;">3,3</td> <td style="text-align: right;">15,3</td> </tr> <tr> <td>Doninga-Sisilli</td> <td style="text-align: right;">8,8</td> <td style="text-align: right;">12,6</td> <td style="text-align: right;">21,4</td> </tr> <tr> <td>Kulun-Ambalmacaw</td> <td style="text-align: right;">7,1</td> <td style="text-align: right;">0,9</td> <td style="text-align: right;">8,0</td> </tr> <tr> <td>Subtotal</td> <td style="text-align: right;">27,9</td> <td style="text-align: right;">16,8</td> <td style="text-align: right;">44,7</td> </tr> <tr> <td>Supervision, monitoring, contingencies and inflation</td> <td style="text-align: right;">11.9</td> <td style="text-align: right;">7.2</td> <td style="text-align: right;">19</td> </tr> <tr> <td>Total in 2014</td> <td style="text-align: right;">39,8</td> <td style="text-align: right;">24,0</td> <td style="text-align: right;">63,7</td> </tr> <tr> <td>Design</td> <td style="text-align: right;">2,5</td> <td style="text-align: right;">1.0</td> <td style="text-align: right;">3,5</td> </tr> </tbody> </table>			<i>Bridge location</i>	<i>US dollars m</i>			<i>Bridge construction</i>	<i>Access roads</i>	<i>Total</i>	Kulungugu-Garu	12,0	3,3	15,3	Doninga-Sisilli	8,8	12,6	21,4	Kulun-Ambalmacaw	7,1	0,9	8,0	Subtotal	27,9	16,8	44,7	Supervision, monitoring, contingencies and inflation	11.9	7.2	19	Total in 2014	39,8	24,0	63,7	Design	2,5	1.0	3,5
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Danish Exporter	Munck Civil Engineering A/S (contractor) 19.2.18 SWECO (previously Grontmij) Denmark (supervision) 13.3.13																																					
MFA guarantee	Date	Amount	Duration																																			
Implementation status	The Taking-over (after final Commissioning) of the project planned end March 2021 expected early 2021 subject to actual completion. Final Verification at End of Defects' Liability Period is thus expected in December 2021.																																					
Feasibility study details	"Pre-Feasibility Study GHA (Ghana Highway Authorities) July 2008																																					
Subsidy – rationale and key features	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><i>(DKK/USD 5.90)</i></th> <th style="text-align: center;"><i>Million DKK</i></th> <th style="text-align: center;"><i>Million USD</i></th> </tr> </thead> <tbody> <tr> <td>Total</td> <td style="text-align: right;">178,7</td> <td style="text-align: right;">30,3</td> </tr> <tr> <td>Interest subsidies</td> <td style="text-align: right;">65,8</td> <td style="text-align: right;">11,1</td> </tr> <tr> <td>EKF prize:</td> <td style="text-align: right;">42,1</td> <td style="text-align: right;">7,1</td> </tr> <tr> <td>Bank margin:</td> <td style="text-align: right;">4,1</td> <td style="text-align: right;">0,7</td> </tr> <tr> <td>Extra cash gift amount:</td> <td style="text-align: right;">16,2</td> <td style="text-align: right;">2,8</td> </tr> <tr> <td>Technical assistance, etc.:</td> <td style="text-align: right;">20,7</td> <td style="text-align: right;">3,5</td> </tr> <tr> <td>Budget margin 20%:</td> <td style="text-align: right;">29,8</td> <td style="text-align: right;">5,1</td> </tr> </tbody> </table>			<i>(DKK/USD 5.90)</i>	<i>Million DKK</i>	<i>Million USD</i>	Total	178,7	30,3	Interest subsidies	65,8	11,1	EKF prize:	42,1	7,1	Bank margin:	4,1	0,7	Extra cash gift amount:	16,2	2,8	Technical assistance, etc.:	20,7	3,5	Budget margin 20%:	29,8	5,1											
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Summary	
Country Context	<p>Ghana, a country with a population of about 25 million people, and a land area of 239.000 km², is West Africa's second largest economy after Nigeria, and Africa's twelve largest. The country has continued to consolidate good governance, and also recently discovered petroleum in commercial quantities, and started producing oil and gas towards the end of 2010. As a result, GDP growth for 2011 is estimated to have increased sharply to 13,7% (7,5% excluding oil) aided by oil revenues and strong export performance of cocoa and Gold. Growth is projected to slow down to 8,3% in 2012 on account of reduced world demand for commodities. On current trends, Ghana's eligibility to graduate to blend or ADB-only country may need to be reviewed during the CSP period. 3. Infrastructure deficiencies, including inadequate agribusiness technology development infrastructure, weak capacities and skills shortages, productivity constraints, managing economic policy in a globalized economy, and weaknesses in the fiscal stances constitute the key challenges Ghana still faces in its development trajectory. Despite this, there are strengths and opportunities, which can be exploited towards placing the economy on a green growth path with increased jobs creation. These include its rich endowment of agricultural, oil and mineral resources, recently improving confidence, deepening domestic and regional markets, tapping the potential of the manufacturing sector and of remittances, getting the most of foreign aid, and maximising the benefits from increased engagements with the major emerging economies of the BRICS. The Bank Group has traditionally played a key role in supporting Ghana's development efforts, and the current promising developments in the country offer an opportunity to continue this productive partnership.</p> <p>Infrastructure deficiency remains a major obstacle to growth. Ghana currently ranks far behind the best performing countries in Africa</p>

6.1 Evaluation Questions



EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?																				
JC 1.1 Alignment with MFA development policies and strategy																					
<p>Northern Ghana is the poorest part of the country. The seven bridges are in the two northernmost regions (Upper West and Upper East), bordering Cote d'Ivoire, Togo and Burkina Faso where 1,8 million people live. The area is characterised by low economic activity, lack of infrastructure investment and is dominated by subsistence and small commercial farms. The main crops are peanuts, maize and yams. In addition, the area is rich in timber and deposits of gold in the north-western region is discovered.</p>																					
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<p>The following chart shows that the quality of the roads in Ghana is in the middle of the African range.</p>																					
<table border="1"> <caption>Graph 8: Infrastructure Index 2009</caption> <thead> <tr> <th>Category</th> <th>Best Rank in Africa</th> <th>Ghana</th> <th>Worst Rank in Africa</th> </tr> </thead> <tbody> <tr> <td>Overall Infrastructure</td> <td>25</td> <td>76</td> <td>131</td> </tr> <tr> <td>Road Infrastructure</td> <td>20</td> <td>76</td> <td>128</td> </tr> <tr> <td>Railroad Infrastructure</td> <td>25</td> <td>105</td> <td>110</td> </tr> <tr> <td>Port Infrastructure</td> <td>24</td> <td>69</td> <td>125</td> </tr> </tbody> </table> <p>Source: AfDB Statistics Department</p>		Category	Best Rank in Africa	Ghana	Worst Rank in Africa	Overall Infrastructure	25	76	131	Road Infrastructure	20	76	128	Railroad Infrastructure	25	105	110	Port Infrastructure	24	69	125
Category	Best Rank in Africa	Ghana	Worst Rank in Africa																		
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Railroad Infrastructure	25	105	110																		
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<p>The project, involving the replacement of temporary and dilapidated bridges, is identified as part of the national strategy for growth and poverty and initiatives for the development of northern Ghana, meets Danida's overall objective of poverty reduction, as the project provides the basis for economic growth and regional development by improving the country's infrastructure. There is good alignment with the 2007 Ghana Joint Assistance Strategy (G-JAS) in which Denmark was one of a number of development partners. It set out commitments by partners to work toward Growth and Poverty Reduction Strategy (GPRS II) (2006 – 2009). Specifically, under Pillar 1: Private Sector Competitiveness PSD/Trade Denmark specifically committed to support 'Objective 5: Infrastructure Support Services Transport. This followed the Ghana-Denmark Partnership. Strategy for Development Cooperation 2004-2008 that also identified transport as a main sector for Danish support. The project is coherent with the Denmark-Ghana. Partnership Policy 2014-2018.</p> <p>The field visit in March 2021 (see attached report) confirmed the importance of the bridges to the local economies in northern Ghana.</p> <p>JC Rating -  Satisfactory – Good alignment with MFA development policies and strategy.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	
<p>Of most relevance is the Ghana National Transport Policy December 2008. It includes: '4.2.4.3 Policy statement: <u>Government will invest in transport infrastructure and subsidise transport services where they provide mainly social and environmental benefits important to users and the country.</u> Strategies 1. Apply subsidies in a transparent manner, targeting the most vulnerable and excluded groups 2. Ensure equity in funding transport infrastructure and services for all modes 3. Develop criteria for modally and geographically equitable development of infrastructure 4. Develop criteria for targeting transport services subsidies'</p> <p>There is therefore good alignment with national development policies.</p> <p>JC Rating -  Satisfactory Alignment with national development policies and strategies</p>	
JC 1.3	
Added value of Project Preparation Facility (PPF)	
JC Rating - PPF not used.	
JC 1.4 Complementarity with development partners operations and strategies	
<p>The two most important development partners in the transport sector in Ghana are: World Bank The 2009 Transport Sector Project⁴⁷ was designed to improve mobility of goods and passengers through reduction in travel time and vehicle operating cost, and to improve road safety standards. Complementary to the DSIF project are:</p> <ul style="list-style-type: none"> • Component C - Improvement of Trunk Roads \$64m • Component D - Improvement of Urban Roads and Infrastructure \$78m • Component E - Improvement of Feeder Roads \$50,5m <p>In 2017 it approved today a \$150 million IDA credit for Transport Sector Improvement Project (TSIP) in Ghana⁴⁸. It will help <u>improve regional connectivity in the Northern Region involving rehabilitation of road links from Tamale to Yendi and Tatala on the Eastern border with Togo, and about 200km of feeder roads to link agricultural value chains to provide access to markets and support agribusiness.</u></p> <p>The TSIP's target area, Northern Ghana, is identified in the 2014 Household Survey as being consistently poorer than the rest of the country</p> <p>African Development Bank Listed in the portfolio disclosed in the AfDB 2012-2016 - Ghana - Country Strategy Paper Annex 7 Portfolio⁴⁹ are seven road sector projects:</p> <ul style="list-style-type: none"> • 2002 Tema-Aflao Road Rehabilitation Project 14 700 000 17.04.2002 • 2008 Tema-Aflao Road Rehabilitation Project - Supplm 25 400 000 16.12.2008 • 2002 Akatsi-Dzodze-Noepe Road(Akatsi-Akanu) 12 720 000 20.12.2002 • 2008 Akatsi-Dzodze-Noepe Road(Akatsi-Akanu) - Supplm 13 400 000 16.12.2008 • 2003 Road Infrastructure Project 2003 18 000 000 17.09.2003 • 2009 Awoshie-Pokuase Road & Community Development 53 590 000 14.10.2009 • Ffulso-Sawla Road 109 720 000 24.11.2010 02.12.2010 <p>In total the transport sector accounted for UA 248m (\$350m) 530 000 out of UA 677m, portfolio (37%). The 7 Bridges project fits well with the more wide-ranging support in the transport sector of AfDB and World Bank.</p> <p>JC Rating -  Satisfactory - Good complementarity with development partners operations and strategies</p>	
JC 1.5	Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

⁴⁷ <https://projects.worldbank.org/en/projects-operations/project-detail/P102000>




⁴⁸ <https://www.worldbank.org/en/news/press-release/2017/06/06/world-bank-supports-road-connectivity-in-northern-ghana>


⁴⁹ <https://www.afdb.org/en/documents/document/2012-2016-ghana-country-strategy-paper-27892>

<p>Indicators:</p> <p>Assessment of development impact in ARs</p> <p>The seven bridges have been built in the two northernmost regions (Upper West and Upper East), bordering Burkina Faso, Cote d'Ivoire and Togo, where 1,8 million people live. The project was a priority in the national strategy for growth and poverty and initiatives for the development of northern Ghana. They are the poorest regions in Ghana. The bridges will improve road links both with the rest of Ghana and also trade with Burkina Faso and Togo. It meets Danida's overall objective of poverty reduction, as the project provides the basis for economic growth and regional development by improving the country's infrastructure. The project thus fulfils the direct objective of the strategic framework of providing support for activities that contribute to sustainable economic growth.</p> <p>JC Rating -  Satisfactory – Appropriate criteria were applied to identify the high development outcome/impact project.</p>
<p>EQ 1 Overall Rating –  Satisfactory The project is relevant to the Denmark Ghana cooperation agreement and the transport sector policy in the country. The field visit confirmed the importance of the bridges to the local economies in northern Ghana.</p>

EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p>Denmark has provided development assistance to Ghana since it gained independence in 1957. The project complies well with DSIF principles for project selection, most notably as Ghana is a low-middle income focus country, involves the supply of Danish laboratory and analytical equipment. Moreover, it fits well with Denmark's 2017 development strategy "The World 2030" for poor and more stable countries, with a focus on gradually shifting from development cooperation to increased political and commercial cooperation. Transport and infrastructure are key focus areas in Denmark Ghana cooperation papers.</p> <p>As regards other DSIF eligibility criteria the project:</p> <ul style="list-style-type: none"> • Fits with Ghana's Transport Policy • Is prioritised as part of the national strategy for growth and poverty and initiatives for the development of northern Ghana, meets Danida's overall objective of poverty reduction, as the project provides the basis for economic growth and regional development by improving the country's infrastructure. • Is complementary to the road sector programmes of AfDB and World Bank. • Is broadly neutral in terms of its environmental impact. It will help safeguard the region against future climate change by helping ensure that roads remain open all year round. • Was tendered to two experienced Danish contractors. • Is within the scope of Denmark Ghana cooperation policies. <p>JC Rating –  Satisfactory Good fit with both cooperation policy in Ghana and the focus on poverty reduction and development.</p>	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p>The Denmark-Ghana. Partnership Policy 2014-2018 sets out four strategic objectives:</p> <ol style="list-style-type: none"> 1. Strengthened political cooperation based on shared values 2. Promotion of inclusive and green growth 3. Economic diplomacy and increased commercial operations 4. Consolidation of results in development programmes <p>The Bridges project in the poorest part of Ghana supports inclusive and green growth.</p> <p>JC Rating –  Satisfactory The Bridges project in the poorest region of Ghana supports inclusive and green growth, one of the four strategic objectives of the 2014 to 2018 Denmark Ghana partnership.</p>	
JC 2.3 Danish business links with beneficiary countries	
<p>Two suitably qualified Danish contractors Munck Civil Engineering and Per Aarsleff tendered to build the bridges and the feeder road. Munck was selected. The field visit conformed that the seven bridges and feeder roads were built to the requisite standard.</p> <p>JC Rating –  Satisfactory The project was an opportunity to use Danish civil engineering expertise in Ghana.</p>	
<p>EQ 2 Overall Rating –  Satisfactory The seven Bridges project fits well with Danish cooperation policies in Ghana as well as the Transport Policy for the country. The potential development outcomes are high given that the bridges are in the two poorest regions in Ghana.</p>	

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
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JC 5.1 Financial additionality of DSIF projects
There are no revenue generating opportunities for the seven bridges or the feeder road which are located in northern Ghana. Traffic volumes for the existing bridges that are being replaced are low. The project is not bankable. Consequently, only concessional funding to Government of Ghana (GoG) was possible. This was an appropriate project for DSIF to support. JC Rating -  Satisfactory financial additionality. Project was not commercially viable and no evidence of alternative sources of concessional finance. AfDB and World Bank are providing substantial amounts for roads in other parts of Ghana.
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality
No non-financial additionality, although there was probably little that DSIF could provide. JC Rating -  Partly satisfactory
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding
DSIF funded 100% of the project. JC Rating - Not applicable
EQ 5 Overall Rating -  Satisfactory financial additionality. Project was not commercially viable and no evidence of alternative sources of concessional finance. AfDB and World Bank have been providing substantial amounts for roads in Ghana.


EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	Although the project was approved in 2010, due to administrative delays in the Government construction only started in 2018. Work by the Danish contractor Munck went generally as planned. Particip attended the handover ceremonies for the six bridges in March 2021. While the general build quality was good, Particip identified a lack of safety barriers on the approach roads to the bridges which in some instances are on quite high embankments. While the three bridges in the NE on the main highway to Burkina Faso are built to a very high standard, it is the view of Particip that the other three bridges to the west on rural roads were over designed given the low traffic volumes expected to use them. More basic designs on these three bridges might have freed some more money to spend on the feeder roads. JC Rating -  - Satisfactory - Overall implementation was good.
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	The appraisal report provides a general development rationale for the project. 'Current traffic counts and future estimated traffic volume support the project's implementation. It is expected that, in the longer term, traffic volumes will increase further in order to ensure that the regions develop economically and socially. The positive, non-quantifiable economic impact of the project comes, inter alia, from better access to markets and regions that are normally difficult to access and, during rainy season, completely cut off from the rest of the country. This will help to stimulate trade in the region and thereby increase employment. It will also deliver savings in terms of reduced transport time and less wear and tear on vehicles, as well as local and regional benefits in terms of improved access to healthcare and education. Improved road safety will also bring socio-economic benefits.' In the long term, it is expected that the bridges and the improved infrastructure will result in more agricultural land being used and the region being developed both socially and economically. The bridges are located on two major highways the N2 and N2 both of which start on the coast (N12 near the Cote d'Ivoire border and N2 in Accra) and 900km to the north connect with highways in Burkina Faso; about 200km north of the Ghana border. The bridges should ensure that they the highways stay open during the rainy seasons. There is lacking, however, a more detailed intervention logic showing target traffic volumes and other attributable development outcomes (increased economic activity such as, for example) the increase transport of agricultural produce or increases in cross border trade) defined. Traffic surveys for the existing bridges show low traffic volumes of just a few hundred vehicles per day, with just one bridge on the N2 at Kulungu close to the Burkina Faso border having about 1.000 vehicles a day as the following traffic survey data show:

Comparison of Average Daily Traffic at Bridge Sites ⁵⁰.

Bridge Site	Average Daily Traffic	
	2007	2013
Kulungugu	795	1076
Garu	707	46
Doninga	-	152
Kulun/Ambalara	78	225

Directly linked to the project, local job opportunities will arise in the course of construction.

The field visit to the seven bridges in March 2021 that coincided with the handover to GHA confirmed their economic importance. The Kulungugu and two Garu bridges that are on the N2 highway that goes up the eastern side of Ghana close to the border with Burkina Faso (see maps above) are especially important for trade between the two countries. Prior to the construction of the bridges floods in the rainy season could severely disrupt traffic on the N2 and trade. The other four bridges are less significant in terms of overall traffic volumes as they are regional roads. Nevertheless, they should contribute to improving transport links in the Upper East and West regions.

JC Rating -  Satisfactory – The AR described expected outcomes clear in general terms but there was insufficient analysis of the benefits for the communities in northern Ghana and increased traffic volumes on the N2 and N12 highways with the attendant increase in economic activity, including trade with Burkina Faso. The field visit, however, confirmed the economic value of the bridges, most notably the Kulungugu and two Garu bridges that are on the N2 highway that goes up the eastern side of Ghana close to the border with Burkina Faso are especially important for trade between the two countries.


JC 6.3 Environmental, social and governance (ESG) risk management

The Ghana Environmental Protection Agency require that a comprehensive environmental impact assessment (EIA) be prepared. During the construction period, the contractor and the engineering company responsible for supervision must prepare and implement an environmental plan as well as a health and safety plan, which will be monitored and monitored by the relevant authorities.

The appraisal reports discuss the environmental issues both during construction and in operation. During construction the possible negative impacts are the impact of management and landscape change through grubbing-up, noise, inappropriate disposal of waste and materials and pollution of water. However, these can be taken into account in the preparation and progress of the work and the tender documents will require protection against possible significant impacts, as well as ongoing environmental controls. Resettlement and appropriation of land is an issue only for the 20km feeder road as the bridges will be replacing existing bridges, although they may be built a short distance away. It is the responsibility of the government to compensate farmers that lose land taken for the feeder road. Munck the selected contractor was required to employ an environmental expert.

Overall, the completed bridges should have a number of positive effects, including improved drainage options, reduced erosion and de-eroded material in water and on riverbed. In addition, the project will ensure that climate change is expected in the form of more severe future floods.




The field visits confirmed the quality of the bridges and feeder roads. In fact, the four bridges on regional roads (Doninga, Sisili, Kulun and Ambalara) were perhaps over engineered given the expected traffic volumes.


JC Rating –  Satisfactory - Environmental risks are modest. Overall, there should be net benefits from the bridges.

JC 6.4 Contribution to climate change mitigation, green and inclusive development

Greater traffic volumes may lead to higher greenhouse emissions but such increases should be negligible. Green and inclusive development effects arise from better access to markets for farmers and communities in northern Ghana.

⁵⁰ Construction of Composite Bridges in Northern Ghana - Ghana Highway Authority Final Engineering Design Report - July 2015

JC Rating –  Satisfactory Green and inclusive development effects arise from better access to markets for farmers and communities in northern Ghana.
JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth
Greater traffic volumes may lead to higher greenhouse emissions but such increases would be negligible. The higher climate resilience of the N2 and N12 highways, especially in the rainy seasons is a significant benefit.
JC Rating –  Satisfactory - The higher climate resilience of the N2 and N12 highways, especially in the rainy seasons is a significant benefit.
EQ 6 Overall Rating -  Satisfactory – The field visit confirmed the economic value of the bridges, most notably the Kulungugu and two Garu bridges that are on the N2 highway that goes up the eastern side of Ghana close to the border with Burkina Faso are especially important for trade between the two countries. The other four bridges should help intra-regional trade. Environmentally the project is beneficial.


EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)	
Project completion occurred in March 2021. The following indicators were set out in the appraisal report:	
Output	
<ul style="list-style-type: none"> • Number of metres of bridge built • Number of km access road 	
Outcome	
<ul style="list-style-type: none"> • Road surface condition (roughness below 2) • Number of washes of road material • Number of motor vehicles using bridge • Number of people using bridge 	
The indicators specified are limited and generic in nature. Only two of the outcome indicators relating to usage volumes of the bridges are appropriate. The other two relate to maintaining the quality of the infrastructure. A more detailed intervention logic should have included:	
<ul style="list-style-type: none"> • Clearly defined time bound, target traffic volumes as well as baselines against which actual volumes may be judged. • Other outcome targets and indicators to measure the wider developmental benefits of the bridges. They might cover, for example, agricultural produce movements to reflect the greater opportunities to sell crops in markets further away, say in southern Ghana or Burkina Faso. 	
Cross border trade across with Burkina Faso that both the N2 and N12 connect with. The 2015 surveys showed that existing traffic volumes while having grown in recent years were still low so that the potential for growth was significant. It remains to be seen whether there will be substantial development outcomes but it is clear that the starting points or base lines are low. The field visit, however, confirmed that the development outcomes overall should be significant, most notably from the three bridges on the N2 near the border with Burkina Faso which should enhance trade between the two countries. The other four bridges to the west are on rural roads where the development outcomes are expected to be more modest.	
JC Rating -  Satisfactory – Potential for significant development but insufficient analysis in AR of the benefits for the communities in northern Ghana and the economic and social benefits from improved transport links, especially in the rainy season. The field visit, however, confirmed that the development outcomes overall should be significant, most notably from the three bridges on the N2 near the border with Burkina Faso which should enhance trade between the two countries.	
JC 7.2 Strong ESG performance of DSIF projects	
Project still under implementation with completion expected in the near future. EIA as part of feasibility study showed that modest ESG risks, mainly during construction. Monitoring reports provided details of community projects undertaken by the contractor, Munck during construction.	

- Sandema District Hospital - rehabilitating drainage systems, landscaping, car park & fencing.
- Sandema District Hospital – Construction of new Morgue.
- Kekasiig Village, Garu – 1xWater Borehole.
- Kekasiig Village, Garu – Culvert Crossing & Headwalls.
- Forest International School, Kulungugu – 1xWater Borehole.
- Kulun Village – 1xWater Borehole.
- Gbenebisi Village – 6km Roads Rehabilitation.
- Yala Village – 2xWater Borehole.
- Kundungu Village – 1xWater Borehole.
- Doninga School – Bus Transport for Field Trip.
- Sandema Paramount Chief – 200T Sand.
- Siniensi Church – 400T Laterite.
- Benchosa Dam.
- Doninga Farm Clearing.

The field visit identified the following social benefits:


Easier access to Sandema Hospital, schools, and other socio - economic facilities.


Easier access to Wa, the regional capital of the Upper West Region during the rainy season for subsistence farmers (maize, beans, rice, cassava, groundnuts and yams) in communities near to bridges.

JC Rating –  Satisfactory - Environmental risks are modest. The social benefits while difficult to quantify include easier access to schools, hospitals and other social infrastructure, as well as improved market access to Wa for subsistence farmers. Overall there should be net benefits from the bridges.

JC 7.3 Satisfactory financial returns and portfolio performance




There is no direct revenue associated with the project and therefore no financial analysis could be undertaken. A key issue after completion is that the Ghana Highway Authority (GHA) carries out regular maintenance to keep the bridges and feeder road in good condition. Funds for maintenance are allocated through the Ghana Road Fund and funds need to be allocated for the construction and subsequent maintenance of the vehicles. It will be a condition of support for the MoFEP and GHA to confirm in writing that there are means of construction and maintenance.


JC Rating –  Satisfactory - There is no direct revenue associated with the project. A condition of DSIF support is that regular maintenance be undertaken out to keep the bridges and feeder road in good condition.

EQ 7 Overall Rating -  Satisfactory – As there are no financial revenues the challenge will be to ensure that regular maintenance be undertaken out to keep the bridges and feeder road in good condition. The field visit confirmed that the development outcomes overall should be significant, most notably from the three bridges on the N2 near the border with Burkina Faso which should enhance trade between the two countries. The other four bridges to the west are on rural roads where the development outcomes are expected to be more modest.


EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?																				
JC 8.1 Level of economic viability																					
The original GHA design report ⁵¹ included the following economic rate of return estimations.																					
	<table border="1"> <thead> <tr> <th style="text-align: center;">Name</th> <th style="text-align: center;">Inv cost Million USD</th> <th style="text-align: center;">NPV (6%) Million USD</th> <th style="text-align: center;">ERR</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Kulungugu & Garu 1+2</td> <td style="text-align: center;">25,3</td> <td style="text-align: center;">53,0</td> <td style="text-align: center;">18,4%</td> </tr> <tr> <td style="text-align: center;">Kulungugu</td> <td style="text-align: center;">13,1</td> <td style="text-align: center;">26,6</td> <td style="text-align: center;">19,6%</td> </tr> <tr> <td style="text-align: center;">Ambalara and Kulun</td> <td style="text-align: center;">19,0</td> <td style="text-align: center;">4,0</td> <td style="text-align: center;">7,8%</td> </tr> <tr> <td style="text-align: center;">Doninga – Sissili</td> <td style="text-align: center;">40,0</td> <td style="text-align: center;">-11,6</td> <td style="text-align: center;">3,0%</td> </tr> </tbody> </table>	Name	Inv cost Million USD	NPV (6%) Million USD	ERR	Kulungugu & Garu 1+2	25,3	53,0	18,4%	Kulungugu	13,1	26,6	19,6%	Ambalara and Kulun	19,0	4,0	7,8%	Doninga – Sissili	40,0	-11,6	3,0%
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The much higher ERRs for the Kulungugu and Garu bridges arise from their location on N2 highway close to the border with Burkina Faso (see map). The N2 is one of the most important road links for trade between Ghana and BF. The other four bridges, in contrast, are on rural regional roads to the west where traffic volumes are much lower.																					
The field visit to all seven bridges confirmed the greater economic importance of the Kulungugu (on the border with BF) and Garu (35km south) bridges, especially in the rainy seasons when flooding occurs. Interruptions to trade on the N2 which links BF with Accra and Tema on the Atlantic coast should be significantly reduced as will journey times as the N2 is upgraded. This Eastern Corridor is 200km shorter than the main route currently favoured via Kumasi, and the N10 in western Ghana.																					


⁵¹ Construction Of Composite Bridges In Northern Ghana - Ghana Highway Authority Final Engineering Design Report - July 2015




<p>While the other four bridges to the west will be beneficial, they are nowhere near as crucial, with alternative routes being available. Nevertheless there, the impact from opening up all weathered access to markets, and not least create the background for trading cash crops will inevitably contribute to increasing rural income. It remains, of course, to be seen how traffic volumes on all seven bridges evolve in the coming years and how the economies in the two regions develop.</p> <p>The economic viability of the bridges and the benefits they are expected to bring must be underpinned by regular and thorough maintenance by GHA of the bridges and feeder roads so that road traffic is not slowed or interrupted. It is noted that since the bridges are not revenue generating such maintenance must be funded from the Road Fund managed by GHA.</p> <p>JC Rating -  Provisional Satisfactory – The bridges have been built to a high standard and are expected to deliver significant economic benefits to the Upper East and West Regions as was confirmed by the field visit. Proper regular maintenance by GHA will be required.</p>
<p>JC 8.2 Level of commercial/financial viability of infrastructure</p>
<p>As noted, the bridges and feeder roads are open to all traffic and there are no tolls or revenues. JC Rating - n/a</p>
<p>JC 8.3 Level of improvements in ESG achievement</p>
<p>While increased traffic volumes will have a negative effect environmentally, the effect is expected to be modest. More importantly, upgrading of the N2 Eastern Corridor will offer a route to Burkina Faso is 200km shorter than the main route currently favoured via Kumasi, and the N10 in western Ghana. Social benefits, including easier access to schools, hospitals and other social services is expected to improve.</p> <p>JC Rating –  Provisional Satisfactory – Overall the road is expected to bring about ESG improvements, primarily from upgrading of the N2 Eastern Corridor will offer a route to Burkina Faso is 200km shorter than the main route currently favoured via Kumasi, and the N10 in western Ghana.</p>
<p>EQ 8 Overall Rating  Provisional Satisfactory – the bridges and feeder roads are expected to be economically, socially and environmentally sustainable, provided maintenance by GHA is carried out as planned. The field visit confirmed the importance of the seven bridges to the Upper East and West regions.</p>

<p>EQ 10 Project risk management of DSIF</p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
<p>JC 10.1 Quality of risk management systems and policies on long-term sustainability</p>	
<p>The AR identified the key risks:</p> <ul style="list-style-type: none"> • Quality and appropriateness of the design and construction • Continuous maintenance of bridges and access roads will be a very important element for the sustainability of the project. This is assured by the transfer of funds to GHA by the Road Fund. <p>Nevertheless, there was a significant delay of about eight years between DSIF approval and the work starting in 2018. This is not unusual in Ghana where both AfDB and World Bank that have extensive road and infrastructure programmes have experienced delays in project implementation. Actual construction was completed in about two years, broadly in line with the implementation schedule.</p> <p>JC Rating –  Satisfactory – Delays in project implementation were not due to failures by DSIF which identified and managed the risks influencing successful implementation.</p>	
<p>JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio</p>	
<p>The following indicators were set out in the appraisal report:</p> <p>Output</p> <ul style="list-style-type: none"> • Number of metres of bridge built • Number of km access road <p>Outcome</p> <ul style="list-style-type: none"> • Road surface condition • Number of washes of road material • Number of motor vehicles using bridge • Number of people using bridge <p>The indicators specified are limited and generic in nature. Only two of the outcome indicators relating to usage volumes of the bridges are appropriate. The other two relate to maintaining the quality of the infrastructure. A more detailed intervention logic should have included:</p> <ul style="list-style-type: none"> • Clearly defined time bound, target traffic volumes as well as baselines against which actual volumes may be judged. 	

- Other outcome targets and indicators to measure the wider developmental benefits of the bridges. They might cover, for example, agricultural produce movements to reflect the greater opportunities to sell crops in markets further away, say in southern Ghana or Burkina Faso.
- Differentiating the outcomes in three groups reflecting the geographical locations of the seven bridges (see maps)

JC Rating –  Partly satisfactory The indicators specified are limited and generic in nature.

EQ 10 Overall Rating  Partly satisfactory While project implementation risk was well managed, the reporting indicators specified were limited and generic in nature.

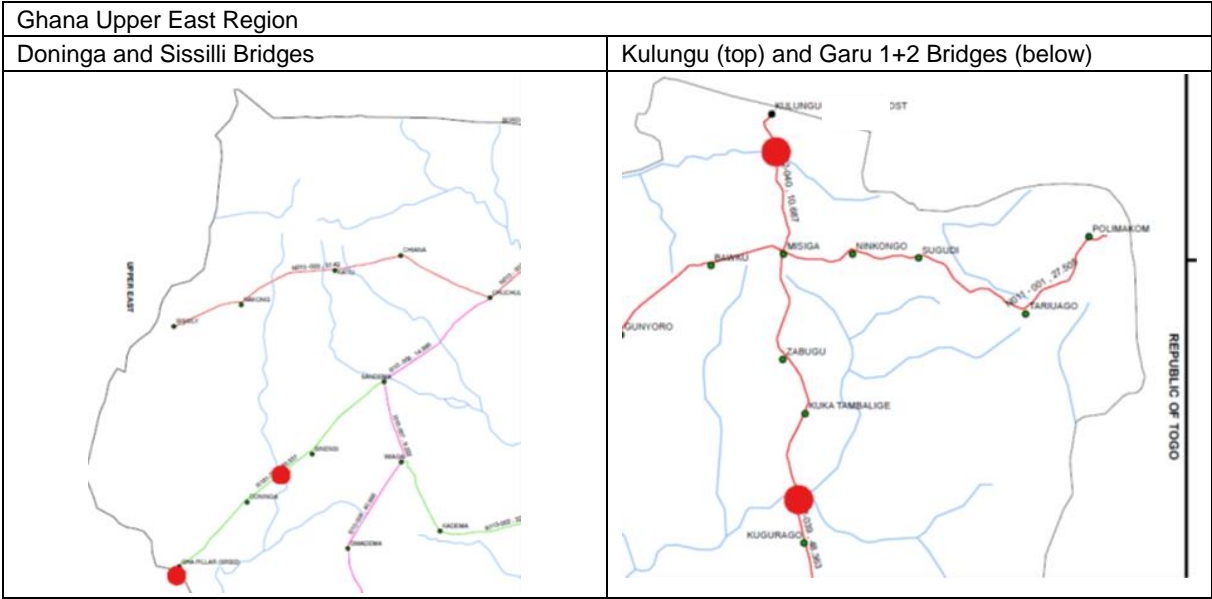
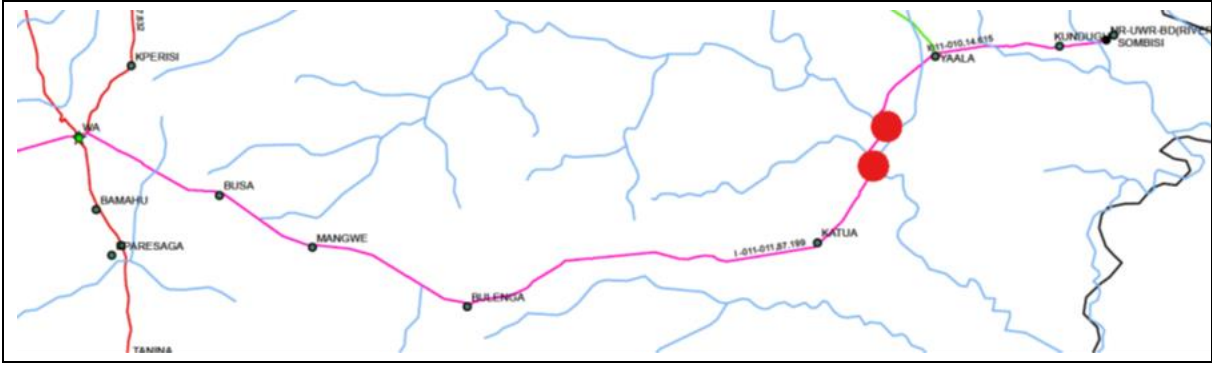
EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
<p>The development logic in the AR was generic and general. The RMS focuses primarily on project outputs. The only outcome indicators relate to volumes of vehicles and numbers of people used. No targets were set. The difference in expected outcomes between the two bridges on the N2 near the border with BF and the other four on rural regional roads to the west was not well articulated.</p> <p>The field visit found that the N2 bridges are expected to deliver much higher outcomes in terms of economic activity but these were not well described.</p>	
<p>JC Rating –  The development logic in the AR was generic and general. The RMS focuses primarily on project outputs. The only outcome indicators relate to volumes of vehicles and numbers of people used.</p>	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>Development objectives were limited to undefined traffic volumes. As the project was only handed over in March 2021, it remains to be seen whether there will be appropriate development reporting by GHA as required in the buyers declaration that is attached to loan agreements. Traffic volumes should, however, be relatively easy to monitor.</p>	
<p>JC Rating –  Provisional partially satisfactory As the project was only handed over in March 2021, it remains to be seen whether there will be appropriate development reporting by GHA as required in the buyers declaration that is attached to loan agreements. Traffic volumes should, however, be relatively easy to monitor.</p>	
<p>EQ 11 Overall Rating  Partially satisfactory –The M&E reporting framework, however, was generic and not well designed to capture the development outcomes The development logic in the AR was generic and general. The RMS focuses primarily on project outputs. The only outcome indicators relate to volumes of vehicles and numbers of people used.</p>	

Field visits and calls

6.1.1 Locations in Northern Ghana of the 7 Bridges

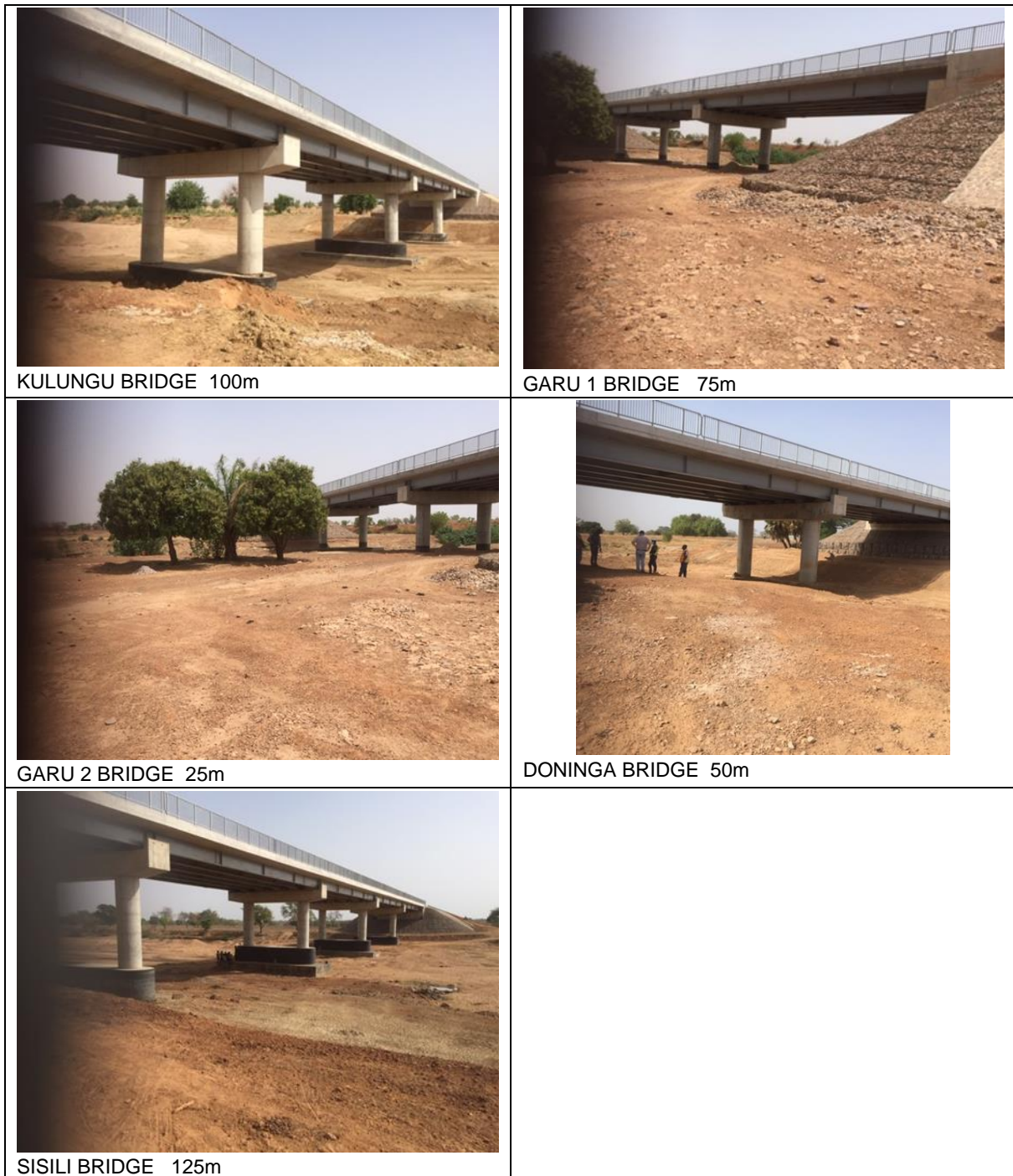


6.1.2 Ghana Upper West Region – Ambalara and Kulun Bridges



6.1.3 March 2021 field visit photos of 7 bridges at handover





6.1.4 DSIF Northern Bridges Field Trip Report by Ing Kwasi Agyei-Yeboah, National Expert Ghana

6.1.4.1 Key Findings:

- MRH/GHA approached Danida for this project following support given to repair bridges in the north damaged as a result of spillway of the Burkina Faso Bagre Dam on the White Volta, 70 km north of the border with NE Ghana.
- Satisfaction with speed and quality of DSIF response for finance.
- Hand-over of projects at the end of March 2021. DSIF consultant was at handover.
- Field inspection of Kulun and Ambala bridges
 - GHA representatives were generally satisfied with the quality and workmanship of the contractor for the two bridges and approach roads: Kulun and Ambalara

- Development benefits: shorter travel times, stimulus to traffic volumes, Danish contractor provided social infrastructure to local communities such as boreholes, school building (under construction).
- Field inspection of **Kulungugu and Garu 1 & 2 bridges** – GHA:
 - GHA insisted that environmental and safety issues need to be tackled before taking over of the bridges. Invisible culvert headwalls, steep unprotected slopes could be washed off due to the nature of the rainstorms in that area and this will cut off the road defeating the purpose of accessibility.
 - GHA generally satisfied with the quality and workmanship of the construction for the bridges and approach roads
 - Kulungugu is a national /international route with cargo trucks and passengers' moving through border to and from Ghana to Burkina Faso, Togo and Niger.
 - Development benefits:
 - easier access to Sandema Hospital, Schools, and other socio - economic facilities.
 - easier access to Wa, the regional capital of the Upper West Region during the rainy season for subsistence farmers (maize, beans, rice, cassava, groundnuts and yams) in communities near to bridges.
 - Expected higher traffic volumes increased in Finsi area.
- Overdesign of **Doninga Bridge** led to a €6million cost overrun .
- While 20km of feeder roads were repaired, other access roads to bridges remain in poor condition.
- Routes using new bridges are not always the most direct. For example, using the new bridge route, from Garu to Walewale is 99K miles. However, an existing route is much shorter at 68 miles.
- Before the new bridge in Kulungugu the nearby border crossing with Burkina Faso could be cut off for days when there was heavy rainfall. The new bridge should ensure that the significant border traffic is not interrupted.

6.1.5 Interviews with Former GHA Directors Who Were Involved in the Launch of the DSIF Bridges Project

6.1.5.1 A1.1 FORMER GHA DIRECTOR OF BRIDGES ING OWUSU SEKYERE ANTWI

- In 2010 following the release of the spillway of the Burkina Faso Bagre Dam, parts of the Northern Ghana were flooded and some existing bridges were damaged. Danida assisted in repairing some of these damaged bridges.
- Following this support, GHA, through the Ministry of Roads & Highways and Ministry of Finance sought the Assistance of DSIF for the 7 Northern Bridges
- There were no issues during the feasibility and appraisal period. DSIF processes and procedures were good.
- Was not part of construction period because he had by then retired.

6.1.6 Field Trip Report

6.1.6.1 DAY 1 – TUESDAY 23RD MARCH 2021

- Journey from Accra to Bolgatanga
- Set off at 5:30 am
- Route was through Adenta in Greater Accra Region through Aburi, Pokrom, & Nsawam in the Eastern Region then to Kumasi, Ejisu, Juaben, Mampong & Ejura in the Ashanti Region and then through Nkoranza, Jema & Kintampo in the Brong Ahafo region ant then Through Tamale in the |Northern Region to Bolgatanga
- Arrived in Bolgatanga around 6 pm, journey of 12,5 hours.
- Drove straight to the Ghana Highway Authority Regional Office in Bolgatanga and had a Brief Meeting with ING William Amankwah Boahen, GHA Project Engineer for the DSIF Northern Bridges Project

- Lodged at the Premier Lodge Hotel

6.1.6.2 DAY 2 – WEDNESDAY 24TH MARCH 2021

GHA's Site Visit For Taking Over Kulun And Ambalara Bridges In The Upper West Region Of Ghana
<ul style="list-style-type: none"> • There was an introductory meeting at the Munck Kulun site camp at 10 am • Participants were the Resident Engineer, Shimeles Molla Tsegaye of SWECO, the GHA's representative from Bridges Division GHAs representative from GHA Head Office Bridges Division ING Lovestone Damalie, Bridge Planning & Maintenance Manager & Shamsu Deen Isah, Senior Bridge Design Engineer, the GHA Acting Upper West Regional Director Andrew Okere, GHA Project Engineer, William Amankwah Boahen, Project manager for Munck Civil Engineering, Matthew Ball, Sweco Contracts Engineer, Gamali Thomas Awude and myself Kwasi Agyei-Yeboah, Particip GmbH • There was site inspection following the introductory meeting. • There was the main meeting after to field inspection to discuss matters arising and taking over of the two bridges, Kulun and Ambalara.
<p>Field Inspection of Kulun and Ambala Bridges</p> <ul style="list-style-type: none"> • Approach road for Kulun bridge is 1,5Km with bridge span 75m and that for Ambalara is 1,7 Km and span 100m. • Embankments are very high and slopes are steep. • Stone pitching is doe for only 50m stretch each on both sides of bridges. Should have been extended to protect slopes. • Topsoil placed on slopes for grass to grow naturally on them in rainy season. • Rains could wash off slopes due to inadequate provision of stone pitching or grassing. • Snag List – no outstanding works. • Safety issues - Approach road dark in the night. There should be reflectors on guard rails & line markings and possibly solar streetlights, because of the high embankment.
<p>Meeting and Matter Arising after the Field Inspection</p> <ul style="list-style-type: none"> • There are environmental and safety issues which need to be addressed in the defect liability period. • Bridge and approach road embankments are very high with steep slopes. Most of the slopes are unprotected although and rains could wash off road and make it impassable although Resident Engineer insists that slopes are well compacted and covered with topsoil and when rains commence, grass will grow naturally. • Stone pitching is only 50m long and could have been extended but RE explained that only 7.000 square metres was provided in the contract yet they constructed 16.000 square meters of stone pitching. • The design should have made provision for a larger area of stone pitching knowing very well the embankments were going to be very high and steep side slopes. • Reflectors should be installed in guard rails for commuters in the night and if possible, solar streetlights provided for good visibility at night since embankments are high.
<p>Taking Over Conclusions</p> <ul style="list-style-type: none"> • GHA representatives were generally satisfied with the quality and workmanship of the contractor for the two bridges and approach roads: Kulun and Ambalara • Bridges were taken over by GHA • By implication, the 1-year Defects Liability Period commenced on the 24th of March 2021. • Any defects and outstanding works, if any, will be executed within the defects liability period and bridges finally taking over on the 24th March 2022.
Interviews with the GHA Acting Regional Director Ing Andrew Okere
<p>Benefits</p> <ul style="list-style-type: none"> • Intervention has created the shortest distance to North East Region • Second shortest route to Tumu. Doninga is the shortest. • Sisala area grow a lot of maize. there is thus easy access to cart farm produce to markets because of the Intervention. • Traffic volumes will increase. • Access to social facilities such as hospitals and schools in Wa. • 1 3- bedroom bungalow and 6 2-bedroom bungalows has been built by Munck as residential accommodation for GHA staff in Wa.
<p>Challenges</p> <ul style="list-style-type: none"> • Project could have tarred a longer stretch instead of only in between the two bridges.
Interview with Mr John Gomelesio, GHA Regional Quantity Surveyor, Upper West Region
<ul style="list-style-type: none"> • Not much involvement on this project as the Host of the region. • More engagement with RE and Munck was needed to iron out discrepancies arising in Project.
Interview with Resident Engineer Mr Shimiles Molla
<p>Benefits</p>

<ul style="list-style-type: none"> • Good job done by Munck • Quality meets specification standards • No outstanding works except a few social infrastructure works being executed by the Munck for the community
<p>Challenges</p> <ul style="list-style-type: none"> • Contract was extended six months. • Not much help from GHA. Communication was not the best. • GHA or representatives only twice attended site meetings. • Unresolved legal issues with Contracts Division of Ghana Highway Authority: Contractual issues which necessitated their presence on site but never happened • There are 5 Contractor's Claims at Arbitration. Claims comprise; Compensation to Munck for time extension; PAYE paid not reimbursed; extra haulage of aggregates issues; variation of drain sizes and disagreements in dayworks. • Dispute Arbitration Board (DAB) is yet to be constituted by GHA because both Munck and GHA have rejected each's proposal of choice of an arbitrator. • Munck has since sent legal issues to ICC for resolution.
<p>Interview with the Contractor, Munck, Project Manager, Mathew Ball</p>
<p>Benefits</p> <ul style="list-style-type: none"> • DSIF is easy to deal with • Communities are happy with their Social Interventions
<p>Challenges</p> <ul style="list-style-type: none"> • Communication and contractual challenges with GHA • If GHA had followed the Contract well, everything would have been smooth • Have a lot of contractual issues with GHA • Facilitation was not done at the Ghana Ports and Harbours Authority by GHA (GHA). • Issues with selection of an arbitrator yet to be resolved.
<p><i>Interview with Honorable Seidu Abu Assemblyman of Katoa Electoral Area in the Amabalara Village</i></p>
<p>Benefits of the Kulun and Ambalara Bridges</p> <ul style="list-style-type: none"> • Bridge intervention is very good • Travel time has reduced • Traffic volume is gradually increasing • Contractor has provided social infrastructure to local communities such as boreholes, school building (under construction) • Lorry fares reduced • Employment of some community persons by contractor Munck
<p>Challenges</p> <ul style="list-style-type: none"> • There are outstanding social infrastructure facilities for Munck to undertake as part of their social responsibility

6.1.6.3 DAY 3 – THURSDAY 25TH MARCH 2021

<p><i>GHAs Site Visit for Taking Over Kulun and Ambalara Bridges in the Upper West Region of Ghana</i></p> <ul style="list-style-type: none"> • Participants were the Resident Engineer, Shimeles Molla Tsegaye of SWECO, the GHA representative from Bridges Division, representative from GHA Head Office Bridges Division ING Lovestone Damalie, Bridge Planning & Maintenance Manager & Shamsu Deen Isah, Senior Bridge Design Engineer, the GHA Acting Upper East Regional Director Philip A. Samwini, Richard Oteng Ansu, GHA Regional Internal auditor, Samuel Osei Asare, Road area manager, Tumu, Joseph Kuwornu, Technical officer GHA, GHA Project Engineer, William Amankwah Boahen, Project Manager for Munck Civil Engineering, Matthew Ball, Sweco Contracts Engineer, Gamali Thomas Awude and myself Kwasi Agyei-Yeboah, Particip GmbH. • There was site inspection at Kulungugu and Garu 1 & Garu 2 Bridges at 9 am. • At 2pm Doninga and Sisili Bridges with 20Km feeder road was also Inspected. • There was the main meeting after the field inspection to discuss matters arising and taking over of the bridges, Kulungugu and Garu 1 and Garu 2 and also Doninga and Sisili Bridges
<p>Field Inspection of Kulungugu and Garu 1 & 2 Bridges</p> <ul style="list-style-type: none"> • Embankments are very high and slopes are steep. • Stone pitching is done for only 50m stretch each on both sides of bridges. Should have been extended to protect slopes. • Topsoil placed on slopes for grass to grow naturally on them in rainy season. • Prescribed grass as indicated in Contract document should have been used. However, funds have been redirected elsewhere because of the variations at the beginning of the works. • Rains could wash off slopes due to inadequate provision of stone pitching or grassing

- Safety issues - Approach road dark in the night. There should be reflectors on guard rails & line markings and possibly solar streetlights, because of the high embankment. Currently, no money in Contract for these activities.

Field Inspection of Doninga and Sisili 1 & 2 Bridges

- Snag List: There are some minor ongoing works such trimming and dredging of riverbed within bridge location.
- Embankments are very high and slopes are steep
- Stone pitching is done for only 50m stretch each on both sides of bridges. Should have been extended to protect slopes
- Topsoil placed on slopes for grass to grow naturally on them in rainy season.
- Prescribed grass as indicated in Contract document should have been used. However, funds have been redirected elsewhere because of the Variations at the beginning of the works.
- Rains could wash off slopes due to inadequate provision of stone pitching or grassing
- Safety issues - Approach road dark in the night. There should be reflectors on guard rails & line markings and possibly solar streetlights, because of the high embankment. currently, no money in contract for these activities.

Meeting and Matter Arising after the Field Inspection

- There are environmental and safety issues which need to be addressed in the defect's liability period
- The GHA Regional Director ING. Philip Samwini insisted that these environmental and safety issues need to be tackled before taking over of the bridges. Invisible culvert headwalls, steep unprotected slopes could be washed off due to the nature of the rainstorms in that area and this will cut off the road defeating the purpose of accessibility.
- The Regional Director indicated that he will not sign the taken over Documents if these issues are not addressed.
- Bridge and Approach road embankments are very high with steep slopes. Most of the slopes are unprotected although and rains could wash off road and make it impassable although Resident Engineer insists that slopes are well compacted and covered with topsoil in which when it rains grass will grow naturally
- Stone pitching is only 50m long and could have been extended but RE explained that only 7.000 square metres was provided in the contract yet they constructed 16.000 square meters of stone pitching
- The design should have made provision for a larger area of stone pitching knowing very well the embankments were going to be very high and side slopes steep
- Reflectors should be installed in guard rails for commuters in the night and if possible, solar streetlights provided for good visibility at night since embankments are high

Taking Over Conclusions

- GHAs' representatives were generally satisfied with the quality and workmanship of the Munck for the four bridges and approach roads and the 20Km Gravel road: Kulungugu, Garu1 & Garu 2 Bridges and Doninga & Sisili Bridges.
- Bridges were taken over by GHA.
- Erosion in some Side slopes should be repaired by Munck at own cost
- By implication, the One-year Defects Liability Period commenced on the 25th of March 2021.
- Any defects and outstanding works will be executed within the defects liability period and Bridges finally taking over on the 25th March 2022.
- UER GHA Regional Director opted to repackage any outstanding works after the defects liability period for a new contractor to execute.

6.1.6.4 DAY 4 – FRIDAY 26TH MARCH 2021

Interview with William Amankwah Boahen Project Engineer GHA

Background Information

Project Appraisal Stage

- Existing Garu Bridge collapsed. It is a flood plain so rains resulted in flooding and blocking of the movement of passengers' goods and services. commuters have to use long alternative routes resulting in increased travel time and cost of travel
- Difficulty in moving from Garu to Bawku and Bolgatanga
- Kulungugu bailey bridge also collapsed and with the Eastern corridor road not fully constructed, most cargo trucks use the central corridor: through Tamale, Kumasi to Accra.
- Kulungugu is a national /international route with cargo trucks and passengers' moving through border from Ghana to Togo, Niger etc. and vice versa
- Doninga / Sisili road was a missing link with no Bridges. Thus, access from Sandema to Welensi and Tumu area in the Upper West was a great challenge.
- Sandema to Welensi a 60 Km stretch was un-engineered road with Doninga to Sisili a farm Track.
- The only defined route was through Tumu, Bolgatanga to Tumu.
- Road from Sandema to Wa is under construction.

- Bolgatanga to Tumu and Tumu to Wa totalled 240km.
- Using the Sandema route reduces distance: Brolga - Sandema-Doninga- Sisili to Wa is 160Km: 80km difference.
- Doninga to Sisili used to be a regional road, a missing link but now upgraded to an inter-regional road. Traffic volume has not increased appreciably but in due time will increase
- Santijan, Gunsli No1 and Gunsli No2 now have easy access to Sandema Hospital, Schools, and other socio - economic facilities.
- Attendance to school has improved because they are able to access the Doninga and Sisili Bridge.
- In Kulun and Ambalara area, there were no Bridges. Communities could no access Wa, the regional capital of the Upper West Region during the rainy season. They have to go through Funsli in the Wa east District a longer route
- Farmers in Kulun and Ambalara are grow maize, doing subsistence farming and could not access markets in Wa
- With intervention access to Markets have improved and also traffic volumes increased in Funsli area. Funsli to Wa, the Upper West regional capital.

Design and Cost Estimation Stage

- Comprised: geometric & drainage design, geotechnical & foundation design, structural & bridge design, traffic & safety, cost estimates & bills of quantities and bidding documents.
- GHA did not take time to review above documents hence so much contractual challenges in the construction stage.
- This resulted in the Claims Expert, who was also the engineer being sacked
- There were some design stage challenges:
- For the Kulungugu Bridge, the proposed approach road was 2km, passing through a school, a fuel filling station and a private residential building. But the survey data had no indication of structures obstructing pathway. Thus, there was no provision in the Bills of Quantities for demolition of structures except for food crops.
- Secondly, in the Special Specification's Test for materials section, there was an indication that GHA was solely responsible for all compensation including acquisition of borrow pits which is normally the obligation of the contractor to incorporate in his unit rates. This created a contention during the Construction stage between GHA and Munck the contractor.
- There was a realignment of the Kulungugu approach road which was not approved by DSIF but Munck went ahead with its construction. This is a variation with associated costs. Part of contingency had to be used to meet extra costs
- Over Design of Doninga Bridge; New Bridge Height was too high, 5m above existing Bailey Bridge. If height was reduced a lot of cost savings could have been made even in Earthworks.
- Geotechnical Issues; Munck confirmation process of levels necessitated foundation design to be revised. Sinking of Piles replaced mass concrete. The Resident Engineer needed GHA to seek approval from DSIF before this change was implemented but latter delayed and Munck went ahead to construct. This had cost implications on the contract and thus access part of the Contingency fund.
- Above issues caused almost all of the contingency fund to be utilized early in the implementation stage.
- Cost Estimation; The high embankments necessitated Stone Pitching on the Slope Surfaces but only 50m of stone pitching was considered. 7.000sqm was provided in Bill of Quantities but 16.000sqm was implemented.
- There was underestimation of Earthworks by 1.4 million cubic metres
- There was also underestimation of Concrete Works especially culvert works by 40% of concrete volume. Thus 6 months extension of time was given to the Contractor notably for earthworks. These had implications on costs during construction period.
- These resulted in an extra 6 million euros to be expended on the contract, the claims expert, who was also the Engineer, was sacked for professional negligence.

Works Procurement and Construction Stage

- Compensation to Contractor for Extension of time: out of the six months extension of time, Munck is to be compensated for only three months. Works during the first three months was done at his own expense.
- Above payment arrangement for extension of time was solely the decision of the Claims Expert (The Engineer) without recourse to the GHA nor Munck.
- FIDIC was solely applied in the administration of the Contracts.
- Danida Guidelines for Works was available but not applied nor enforced.
- Environment and Safety Issues: Because of High Embankments and Steep Slopes, there was the need for more stone pitching works to have been done. Guard Rails are inadequate and needed to be extended or crush barriers supplemented with. Grassing is needed at medium to low embankment sections. More reflectors are needed and also road line markings, signage and solar street lights for a clearer visibility at night.
- Unfortunately, Munck is not in the position to carry out these safety and environmental measures because all the funds have already been exhausted.

Benefits of the Interventions

<ul style="list-style-type: none"> • 8 No Bungalows have been built as residential accommodation for GHA Staff in Bolgatanga; 1 No. three bedroom Bungalow and & 7 No. Two Bedroom Bungalows • 7 No Bungalows have been built as residential accommodation for GHA staff in Wa: 1 three-bedroom bungalow and 6 two-bedroom bungalows • An office block has also been built in GHA Regional Office in Bolgatanga currently being used as the Project Office and will soon be released to the Regional Office to augment office accommodation. • Doninga to Sisili used to be a regional road, a missing link but now upgraded to an inter-regional road. • Santijan, Gunsu No1 and Gunsu No2 now have easy access to Sandema Hospital, Schools, and other socio - economic facilities. • Attendance to school has improved because they are able to access the Doninga and Sisili Bridge. • In Kulun and Ambalara area, there were no bridges. Communities could not access Wa during the rainy season but with the intervention, there is accessibility • Farmers in Kulun and Ambalara are grow maize, doing subsistence farming and could not access markets in Wa but now they can because of the intervention • With intervention access to markets have improved and also traffic volumes are gradually increasing. • Travel distances has shortened in some cases and hence reduction in travel time and costs. • Vehicle operating cost has reduced
<p>Challenges</p> <ul style="list-style-type: none"> • General the legal framework for the contracts was quite faulty • There were design challenges and cost under estimation • Communication was not so good, notably between GHA and Munck • GHA did not thoroughly review project documents, thus was found wanting
<p><i>Interview with Ing Philip Samwini Abaahenpieng, Regional Director Upper East Region, Bolgatanga</i></p>
<p>Benefits</p> <ul style="list-style-type: none"> • Access has improved and vehicles will no longer have to wait till floods subside before crossing bridge points • 8 Bungalows have been built as residential accommodation for GHA staff in Bolgatanga: 1 three-bedroom Bungalow and 7 Two Bedroom Bungalows • An office block has also been built in GHA Regional Office in Bolgatanga
<p>Challenges</p> <ul style="list-style-type: none"> • General Items should have made provision for GHA's supervisory activities. • Did not have a budget in the region for site meetings and Monitoring Activities. • Safety and environmental issues need to be immediately addressed: sees steep slopes on high embankments as unprotected and road could be cut off during heavy rains and render roads impassable hence defeating the intervention benefit • Money should at all cost be found to solve the safety and environmental issues • Will not sign the taking over documents if nothing is done about the above issues. • The Upper East Regional Minister complained to the President of Ghana of the non-involvement of the regional stakeholders • Thus, project has no impact in the Region.
<p><i>Meeting with William Boahen, Philip Samwini and Collins Donkor</i></p>
<ul style="list-style-type: none"> • UER Regional Highway Director and GHA Director of Contracts did not like behaviour of the Munck. Munck exhibited some arrogance and wanted to their way. • Acquisition of lands for site office and Borrow Pits was shrouded in secrecy notably by the Valuer from GHA Head Office. There was no consultation during negotiations • Of the view that Consultant, SWECO and Contractor Munck connived to cause unwarranted exhaustion of the Contingency at the earlier stage of the Construction period
<p><i>Interview with Michael Birk Jensen Monitoring Consultant of Cowi Consult</i></p>
<p>Benefits</p> <ul style="list-style-type: none"> • Satisfied with the Supervisory activities of the Consultant, SWECO • Satisfied with the Quality and Workmanship of the Contractor, Munck • Environmental and Safety Issues: sees no problem with the status Quo • Agrees with the Resident Engineer and Munck that there is no need for further Stone pitching and grass will grow on steep side slopes during rainy season • His Mandate is the Construction Period and not Pre nor Post.
<p>Challenges</p> <ul style="list-style-type: none"> • Communication between GHA and Munck was not the best. Could have been better. • GHA Valuer was very difficult. Did his own thing • GHA is responsible for the delay in setting up the DAB and selecting an Arbitrator. • Processing of Interim payment Certificates (IPCs) delayed at GHA Head Office

- There should have been an Item in the General Items of the Contract to provide Fuel and some incentives to the GHA and other to enable them Oversee project effectively, e.g. Attendance of Site meetings etc.

6.1.6.5 DAY 5 – SATURDAY 27TH MARCH 2021

<i>Interview with Mr. Musah Nuhu, Elder of Ghana Private Road Transport Union (GPRTU)</i>
<p>Awareness of DSIF Project</p> <ul style="list-style-type: none"> • Mr. Musah Nuhu is Aware of the DSIF Project • Even got employed as a Bus driver on the Project of Munck Construction company
<p>Benefits of the Project in the Perspective of Driver Union</p> <ul style="list-style-type: none"> • Accessibility from Sandema and other towns through Doninga to Upper west Rion was a Challenge before construction of bridges but with the intervention, challenge has partially been solved • Food crops such as Maize, Beans and rice can be transported from Fumbisi to Bolgatanga and Tumu in the Upper West. Also, yams can be transported from upper west to Sandema and Bolgatanga • Traffic Volume is gradually increasing • Access to Sandema Hospital from communities within the Bridges catchment area is encouraging • Vehicle operating cost is reduced • Travel time has reduced
<p>Challenges</p> <ul style="list-style-type: none"> • The section of the road between Sandema and Doninga and beyond the 20km project stretch to Upper west region is bad and should have been part of the project to give a smooth ride along that route. This would have increase traffic volume on that stretch • The 20km stretch should be tarred because the Munck has done a good job and sealing will preserve the good work done. • The road section at the beginning of project road at Doninga floods and needed a culvert but Munck said section is not part of contract • At Siniensi (before Doninga), water ponds on the road during rainstorms and become impassable
<i>Interview with Assemblyman for Doninga, Hon Mathias Akanbong</i>
<p>Awareness of the Project</p> <ul style="list-style-type: none"> • Heard of DSIF Bridges • Bridges were well built • Intervention is very good and has helped Communities
<p>Benefits of the Bridges Construction Intervention</p> <ul style="list-style-type: none"> • There is an increased access to education facilities: Community day school in Kanjaga Village, Fumbisi Agricultural Senior High School, Sandema Secondary Technical School and Sandema senior High school. • Easy access to health facilities Sandema is the district capital of Builsa North district. <ul style="list-style-type: none"> ○ It has a district Hospital which serves catchment villages (some have clinics but no medical doctors so have to be referred to Sandema hospital) when bridges were absent, communities were cut off from the Sandema hospital during rainy season due to flooding ○ The major towns in Builsa North are Wiega, Siniensi and Chuchuliga. Wiega and Siniensi have clinics but no doctors and Chuchuliga has a chips compound. ○ All come from the major towns to the Sandema hospital on referrals to see a doctor ○ Builsa South has its District capital as Fumbisi. Fumbisi has no District hospital. The major towns under this district are Doninga, Bachongsa, Kanjaga, Kunkuna (where Sisili bridge is located), Wiesi Gbedemblisi and Gbedema. All these towns therefore patronize the Sandema District Hospital. The bridges therefor are a huge asset to the communities • There is easy access to Market Centres as a result of the intervention of the Bridges notably during rainy seasons: <ul style="list-style-type: none"> ○ There are two Major market centres in the Bridges Catchment are the Sandema Market in the Builsa North district and the Fumbisi market in the Builsa south district ○ For Sandema Market, every three days is a Market day and for Fumbisi market, every seven days is a Market day. Thus, during market days traffic Volumes increase due to transport of food produce from various communities within the bridges' catchment localities and other towns in Upper west region to sell their products and foodstuffs ○ The section of the road between Sandema and Doninga and beyond the 20km project stretch to Upper west region is bad and should have been part of the project to give a smooth ride along that route. cassava are brought in from the Sisala area ○ There is a rice factory in Fumbisi. Thus, Rice and Beans are transported to the Upper West Region markets accessing the DSIF Bridges • Communities have also benefitted from the Munck's social responsibility to surrounding communities. <ul style="list-style-type: none"> ○ Doninga has had 2 boreholes. ○ Santija has 2 boreholes. ○ Sandema Hospital has a new morgue, fence wall, walkways and drainage systems.

<ul style="list-style-type: none"> ○ Siniensi Clinic has a maternity block. ○ Compensation was paid to persons whose crops or property was affected during the construction ○ Some members of the community were employed by the Munck as artisans, drivers & labourers etc. some of them have gained permanent employment in other companies
<p>Challenges of the Project</p> <ul style="list-style-type: none"> • Unprotected side slopes of the high embankment are could be washed of by torrential rains. Stone pitched could have been extended • Tarring of approach road could have been extended to Doninga town • Munck promised the chief of Doninga, land Owners in Doninga and Wupesa Communities dams but promise was not fulfilled
<p><i>Interview with Mr Prosper Asandem, Hospital Administrator, Sandema Hospital</i></p>
<p>Benefits</p> <ul style="list-style-type: none"> • The construction of the Doninga and Sisili bridges has created access to remote areas. Thus in 2020 no Maternal Death was recorded in the Sandema hospital • Drainage works have been done in the Sandema hospital compound • A holding pond (mini dam) has been construction to catch stormwater and transport through a constructed spillway to a suitable outfall outside the hospital. This has reduced flooding in the hospital compound during rainstorms • A new morgue has been constructed • 4 big septic tanks have been constructed to store hospital waste • Pavement walkways have been constructed • Fence wall has been constructed all around the hospital
<p>Challenges</p> <ul style="list-style-type: none"> • Gutters in town have inadequate capacity hence stormwater from hospital holding tank flowing through spillway floods some areas of the community • Hospital had two Doctors. One has left and there is no replacement
<p><i>Interview with the DCE of Builsa South District, Fumbisi, Honorable Daniel Kwame Gariba</i></p>
<p>Benefits</p> <ul style="list-style-type: none"> • DSIF Bridges is a good project. • Work done is good. • Best bridges so far. • Communities are happy with work done and the intervention. • Brought jobs to the area. • Access to Upper West Region has improved: Wa West, Sisala east etc. • Shortest distance to Upper West Region. • Access to and from Builsa south was a challenge but now has been solved. • Local trade is much better. • Technical skills were acquired by members of the community who worked on the project from and some have got permanent jobs with other companies. • Munck has provided a lot of social infrastructure to the communities such as boreholes, a few dams, expansion works at Sandema Hospital and Siniensi clinic. • Builsa North and Builsa South has One Paramountcy which is located at Sandema.
<p>Challenges</p> <ul style="list-style-type: none"> • Initial challenge – Road was raised to a high embankment as such affected the Doninga market. Thus, relocation was necessary. Munck promised to construct a new market but failed to do so. • Later on, some funds were given to the community by the Munck as compensation to the community to relocate market. • Compensation was paid to all affected persons except one. • Environment and safety issues at the bridge sites needs to be relooked. Paramount Chief expected the 20km road to be tarred to consolidate gains.

6.1.6.6 DAY 6 – SUNDAY 28TH MARCH 2021

<p><i>Interview with Mr Azuma Azure, Passenger Car Driver at Garu Lorry Station in the Upper East Region</i></p>
<ul style="list-style-type: none"> • Passenger drivers of some lorries use the Garu- Kupalugu – Binduri route to Bolgatanga. It is shorter route than using the bridges route to Kumasi • The OSA buses use the Garu 1 & 2 Bridges to Accra • Vehicles from Bawku to Garu also access the bridges • Most Gushegu Vehicles use the Garu-Bawku-Gushegu to Yendi route
<p>Benefits of the Bridge Project</p> <ul style="list-style-type: none"> • Yams, cassava, beans, maize and groundnuts are transported from Gushegu through Bawku to Garu using the bridge access. Road sections at the are no longer cut off during rainstorms.

<ul style="list-style-type: none"> • Farmers in Garu cultivate large quantities of onions some of which are send to markets in Gushegu and beyond (Kumasi and Accra). • The Tambo dam near the Garu Bridges is under construction and when completed will augment more onions to be grown on irrigated land. • Cattle, goats and sheep are also transported to Kumasi and Accra. • The route from Kupalugu to Bawku has been reduced from 22km to 18km due to the Bridge intervention.
<p>Challenges</p> <ul style="list-style-type: none"> • Most cargo vehicles use the eastern corridor route so ongoing construction works should be accelerated to increase traffic volumes. • If road is tarred more vehicles will use the bridges. • VVIP Transport Services established an Accra Office at the Garu Lorry Station. However due to bad roads, the office closed because it was incurring high vehicle operating costs and riding surface of roads was not smooth and comfortable for passengers.
<p><i>Interview with Yakubu Issifu, Union Secretary, Progressive Transport Owners Association (Protoa) Garu – Samreboi Station and Issah Osman, Cargo Union Chairman, Garu to Kumasi</i></p>
<p>Benefits</p> <ul style="list-style-type: none"> • Fruits & vegetables produced in Garu are onions, pepper, water melon, cabbage, okra and tomatoes. • Other food products are maize, millet, beans and groundnuts. • These are transported to Accra, Kumasi and Takoradi. • Maize is transported to poultry farmers in Ashanti Region. • OA buses use the Bridges road to Kumasi and Accra. • Some Cargo vehicles and Timber Cars use the Bridges.
<p>Challenges</p> <ul style="list-style-type: none"> • When bridge was absent drivers used the Nakpanduri road to Gushegu and Yendi which is not fully motorable where Seese are experienced flood sections during rainstorms. • After the bridges were constructed, drivers still use the Nakpanduri road because the route is shorter. • For the new bridge route, Garu to Bawku is 18 Miles. Bawku to Bolgatanga is 48 miles. Bolgatanga to Walewale is 33 Miles. Hence total distance from Garu via new bridges to Walewale is 99 miles . • For the diverted route, Garu through Nalerigu to Walewale is 68 miles. Thus, a shorter route (31 miles shorter). • New Bridge route has 18 Police barriers and diverted route has only 4 police barriers. Commercial drivers will always avoid routes with so many police barriers • If the entire Eastern Corridor road is completed, more vehicles will access the bridge because travel time and vehicle operating cost will reduce. Currently work is ongoing on the Yendi-Bimbilla-Oti Damanko stretch of the corridor and also some sections southward.
<p><i>Interview with Mr Ebenezer Nana Gyenin, Assistant Inspector, Immigration Service, Kulungugu Border to Burkina Faso</i></p>
<p>Benefits</p> <ul style="list-style-type: none"> • Movement to Bawku and its environs is now easy. • Trade - transportation of goods is better served. • Natives are satisfied with the bridge construction.
<p>Challenges</p> <ul style="list-style-type: none"> • Road should be constructed in addition to the bridges • Lots of potholes slowing travel time • Easy immigration operational movement is needed on the road but itis bad.
<p><i>Interview with Nii Adjei, 2ic Of Customs Division, Kulungugu Border Mr Martin Paddy, Raiii, Customs Division, Kulungugu Border</i></p>
<p>Benefits</p> <ul style="list-style-type: none"> • Bridge Intervention is very good. • Previously when it rains, bridge location was cut off and there was no movement for two days. With the Intervention the situation has changed for the better.
<p>Challenges</p> <ul style="list-style-type: none"> • The side slopes of the bridge are steep and embankment high. However, there is no slope protection on a greater part of the slopes. • Windstorms are strong and rainstorms are heavy and could wash off the high unprotected slopes. • No road signs. • No reflector on the bridge structure. • Guard rails should be extended to the end of the approach road. • A truck fell off the approach road. • No street lights. roads are dark and filling stations fearing armed robbery attacks, close early thus creating lack of fuel in the night.

<i>Interview With Yusif Alhassan, Cargo Driver</i>
<p>Benefits</p> <ul style="list-style-type: none"> • Transports iron rods to Niger. • Driven on through this stretch of road for 4 years. • Previously during rainstorms could get stuck at border for 3 to 4 days but with intervention of the bridges the problem is solved and there is easy access to the border. • Satisfied with the intervention and construction.
<p>Challenges</p> <ul style="list-style-type: none"> • No challenges.
<i>Interview with Nane Smiler Abudu, Cargo Driver from Niger</i>
<p>Benefits</p> <ul style="list-style-type: none"> • Driver sends onions to Accra from Niger. • Used road for ten years. • Before bridge intervention could get stuck for a day or two but now there is free flow. • Satisfied with the intervention and construction
<p>Challenges</p> <ul style="list-style-type: none"> • No Challenges.
<i>Interview with Iddrisu Mahamadu, Driver from Bawku and Union Chairman of Onion Drivers Association / Discipline Committee Chairman</i>
<p>Benefits</p> <ul style="list-style-type: none"> • Driven on road for 33 years. • Satisfied with bridge construction and intervention. • Free movement during rainstorms. Previously could get stuck at the border for two days and because there is no alternative route.
<p>Challenges</p> <ul style="list-style-type: none"> • Too much dust on the road. • Road must be tarred.

6.1.6.7 DAY NUMBER 7 – 29TH MARCH 2021

- Journey from Bolgatanga through Yendi and Bimbilla (Eastern Corridor) to Accra

Challenges

- Too much dust on the road.
- Road must be tarred.

6.1.6.8 DAY NUMBER 8 – 30TH MARCH 2021

<i>Brief General Comments per above by Ing Kwasi Agyei-Yeboah</i>
<p>Efficiency</p> <ul style="list-style-type: none"> • To a larger extent the outputs outweigh the inputs of this DSIF intervention project. • Most project components have been delivered as planned. • It could have been better.
<p>Effectiveness</p> <ul style="list-style-type: none"> • To a larger extent, formally agreed objectives have been achieved • Beneficiaries and users of the facility are about the intervention because of free accessibility. • Traffic flow is gradually increasing.
<p>Impact</p> <ul style="list-style-type: none"> • Intervention has impacted beneficiaries economically and socially. • Access to markets have improved which in effect will increase incomes of beneficiaries of the intervention. • Access to social amenities such as hospital and schools have increased.
<p>Relevance</p> <ul style="list-style-type: none"> • Generally, intervention was relevant because lack of bridges was causing accessibility challenges during the rainy seasons. With this intervention the challenge is solved. • Vehicle Operating cost and Travel time has reduced hence cost savings. • Beneficiaries want more of the interconnected routes to be repaired so as to accelerated intra trade and cross border trade and also more accessibility to social services.
<p>Sustainability</p> <ul style="list-style-type: none"> • There should be an integrated approach to these interventions. Constructing a bridge without repairing roads still make travelling difficult and commuter s look for alternative routes.

- Environmental and safety issues should be seriously considered in order not to erase the gains in these interventions.

7 Ghana: Environmental Monitoring Laboratory at UMaT

Overview


Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> • The environmental laboratory (EL) started operations in 2019. • The global inspection and testing company SGS which has been in Ghana for 60 years dominates the testing market. Although the fees charged by SGS are higher than UMaT, it is still capturing the market. It is unclear how UMaT can compete in a sustainable way with SGS. • Due to bureaucratic delays, that put the project eight years behind schedule, UMaT has equipment that is reasonable but not the most modern and is not regularly calibrated. Some equipment is obsolete. Machines have not been recalibrated since installation; Certification from Ghana standard board is obsolete. Lack of certification is deterring clients from using the UMaT laboratories: ISO Certification and Ghana Standard Board Certification. • The rationale for the EL is unclear, there is no business plan or model. Instead it operates on the basis of covering the cost of consumables as a university department. EL is not marketing its services. • UMaT covers the cost of the five technicians and eight academic staff. • There are no funds or budget to replace equipment. • Teaching appears limited to short courses for students studying engineering and mining, as well as for mining companies and other interested parties. • No ISO Certification of lab. • A lot of laboratories are springing up and prices are becoming very competitive. • Small scale/informal gold miners are not ready (or able?) to follow environmental standards and thus degrade lands prospecting for gold. 	

Summary	
Project name	Environmental laboratory at the University of Mines and Technology,
Type of project	Education
Project No.	104.O.30.Ghana
Description	<p>The development objective of the project is to improve environmental conditions in mining. The immediate aim is to set up an environmental laboratory at the University of Mines and Technology (UMaT) in Tarkwa, Ghana, to train environmental education and provide environmental courses, as well as to act as a laboratory for environmental approvals and monitoring. In addition, the Environment Department will train communities and organisations to help protect their interests, as well as improve cooperation with mining companies on working conditions.</p> <p>University of Mines and Technology in Tarkwa, in the Western Region of Ghana, is located in one of the most important mining areas in Ghana. UMaT is the only mining technical university in West Africa and as a result receives students from all over the region and the rest of Africa. UMaT is a public educational institution under the Ministry of Education and has approximately 1800 students. It is expected that 3.000 environmental engineers will be trained over a 5-year period. In addition, the university carries out environmental studies for environmental authorities, mining companies and local communities, but the types and number of these studies are severely restricted by access to laboratory equipment.</p> <p>Mining is one of the most important sectors of the Ghanaian economy. Almost 50 percent of export earnings come from mining, the vast majority of which comes from gold. In addition to gold, Ghana is one of the world's largest exporters of manganese, as well as large deposits of bauxite, of which the extraction of the latter is expected to increase sharply in the coming years in connection with the establishment of an aluminium smelter. Mining contributes more to gross domestic product than the traditional sectors of agriculture, forestry and cocoa, which together with mining and the emerging oil industry are both the major contributors to the economy. It is estimated that 12 per cent of state revenue comes from mining. At the same time, the mining sector is one of the largest employment areas, with 25-30.000 employed in the construction of the mines, while around 500.000 are employed in small mining.</p>





Summary																								
	<p>The mining sector is regulated by the Minerals Commission under the Ministry of Lands and National Resources.</p> <p>The mining sector can be roughly divided</p> <ul style="list-style-type: none"> • Large-scale operations are made up of international mining companies, These mines are operated capital intensively and represent very large investments in equipment. Laboratories are often attached to their own laboratories, although they are not equipped to carry out all types of environmental studies or to investigate to the required extent. • Small-scale mining, on the other hand, is labour intensive and is carried out with simple equipment and often under poor environmental and health conditions. This type is also covered by environmental regulation but does not have the resources to comply with it or carry out the required studies. 																							
Sector	Social - education																							
Country	Ghana																							
Sponsor	University of Mines and Technology, Tarkwa																							
Other stakeholders	Ministry of Finance																							
Clearance in principle																								
Approval/Binding Commitment	2 December 2016	Loan / Investment Agreement Date	30 November 2016																					
Danish Bank	Nordea Bank																							
Loan Duration + Grace Period																								
Project Amount and funding plan	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: left;">Investment budget</th> <th style="text-align: right;">US\$m</th> <th style="text-align: right;">DKKm</th> </tr> </thead> <tbody> <tr> <td>Laboratory equipment</td> <td style="text-align: right;">9,60</td> <td style="text-align: right;">53,8</td> </tr> <tr> <td>Supplies</td> <td style="text-align: right;">1,47</td> <td style="text-align: right;">8,2</td> </tr> <tr> <td>Training</td> <td style="text-align: right;">0,67</td> <td style="text-align: right;">3,7</td> </tr> <tr> <td>Construction work (building)</td> <td style="text-align: right;">0,20</td> <td style="text-align: right;">1,1</td> </tr> <tr> <td>Contingencies (5%)</td> <td style="text-align: right;">0,60</td> <td style="text-align: right;">3,3</td> </tr> <tr> <td>Total*</td> <td style="text-align: right;">12,54</td> <td style="text-align: right;">70,1</td> </tr> </tbody> </table> <p>Under the project, the following equipment is to be procured and used for the establishment of the project:</p> <ul style="list-style-type: none"> • Equipment for the water quality and environmental health laboratory. • Equipment for the waste water laboratory. • Equipment for the soil and rock mechanics laboratory. • Major laboratory analytical equipment for the analytical chemistry laboratory. • Geophysical testing equipment and field instruments for sampling and measuring soil, water, air, dust and noise pollution – mobile environmental laboratory. • Teaching aid equipment. 			Investment budget	US\$m	DKKm	Laboratory equipment	9,60	53,8	Supplies	1,47	8,2	Training	0,67	3,7	Construction work (building)	0,20	1,1	Contingencies (5%)	0,60	3,3	Total*	12,54	70,1
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Danish Exporter	Desmi Contracting																							
MFA guarantee	Date	Amount	Duration																					
Implementation status	Operations started in 2019. End of defect period certification by DSIF evaluation consultant SWECO was due in April 2020 but was postponed due to Covid travel restrictions. This likely to happen later in 2021.																							
Feasibility study details	November 2010 feasibility study - "Establishment of an Environmental Monitoring Laboratory at the University of Mines and Technology" -provided by Ministry of Finance and Economic Planning.																							

Summary			
Subsidy – rationale and key features		Million DKK	Million USD
	Interest subsidies:	10,80	1,93
	EKF premium:	5,45	0,98
	Bank margin:	0,62	0,12
	Extra cash gift amount:	9,47	1,70
	Technical assistance, etc.:	1,50	0,27
	Budget margin 25%:	6,96	1,25
Country Context	<p>In July 2011, Ghana achieved the WBG per-capita income threshold for classification as a Lower Middle Income Country (LMIC). This achievement was only part of a changing economic landscape that began to emerge during the last Country Assistance Strategy (CAS) period. Ghana's economy has been on a high growth pattern for most of the last decade and has been accompanied by significant poverty reduction.</p> <p>. Mining. Challenges in the management of the mining sector in Ghana include the tendering of some of the high-grade non-gold deposits in addition to the need to improve the artisanal practices of small scale miners whose growing activity, driven by rising international prices of gold, is having adverse environmental and social impacts⁵². The mining sector represented a major part of Ghana's economy, providing roughly 5 percent of GDP, 12 percent of government revenue, and 37 percent of exports, primarily from large scale gold mining by international companies.</p>		

7.1 Evaluation Questions




EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The mining sector has serious environmental impacts, including vegetation removal, land degradation, ecosystem disruption, air/noise/vibration pollution from blasting and other operations, water contamination from tailings and chemicals, mercury pollution and poisoning from gold mining, and cyanide pollution and poisoning from illegal/informal gold mining.</p> <p>University of Mines and Technology is the only university in Ghana and west Africa educating mining and metallurgical engineers. It is located in the heart of the mining region in Ghana. UMaT has 1.600 undergraduate students (17% female), and 180 postgraduate students. In the next 5 years it is expected that 3.000 engineers will graduate from the environmental Laboratory at UMaT, including 100-200 from neighbouring countries. In addition the project will:</p> <ul style="list-style-type: none"> • Provide consultancy work for major mining companies as part of an extension service in water analysis, blast monitoring, rock and soil testing and provision of meteorological data. • Community training in environmental monitoring and allied services <p>The project will thus support the specific objective of focusing on environmental and climate challenges, as well as health improvements</p> <p>There is good alignment with the Denmark-Ghana. Partnership Policy 2014-2018 the RFOBL is compatible with one of the four strategic objectives: (i) Promotion of inclusive and green growth. It fits with one of the focus areas: (ii) private sector development and green growth. Reducing the risk of serious environmental damage that mining can cause and raising ESG standards in Ghana aligns strongly with the DSIF and MFA commitments to green growth.</p> <p>JC Rating -  Satisfactory – Raising ESG standards in Ghana's most important export sector aligns well with the Denmark-Ghana. Partnership Policy that inter alia supports green growth.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	
<p>The mining sector in Ghana has to comply with the following national environmental and safety regulations:</p> <ul style="list-style-type: none"> • Environmental Assessment Regulation 1999 LI 1652. • EPA act 1994, Act 490 Part II regarding chemical control and management. • Radiation Protection Institutes Requirements 1993 LI 1550. • Factories, Offices and Shops Act, 1970 (Act) 328). • Ghana National fire Service Regulation 2003, LI 1724. • EPA Environmental Quality Guidelines. 	

⁵² World Bank Country Partnership Strategy Ghana FY13-FY16 August 20, 2013


<p>In addition there is the Minerals and Mining Act (MMA) 2006 that covers all aspects of mining and mining regulations in Ghana. One of the objectives of the MMA is to bring Ghana's regulatory regime up to international best practices. It does, not, however, deal in detail with environmental issues and standards. All mining companies are required to prepare and submit monthly environmental monitoring reports to EPA, which covers more than 20 parameters. None of the mining companies can perform the full range of analysis themselves and are therefore dependent on an external laboratory. According to the informants interviewed during the appraisal mission, the only laboratory currently undertaking the necessary analysis is typically overloaded, the results are delivered months too late and some of the results appear questionable. The environmental laboratory (EL) is therefore expected to be busy with a large amount of routine testing that should provide a regular income.</p> <p>The UMaT laboratory will help new mining companies undertake the required environmental impact assessments (EIAs) that are required for clearance by the Ghana Environmental Protection Agency (EPA). In addition mining companies must submit annual environmental reports to the EPA. EIAs and EPAs require, inter alia, chemical and other analyses to be done. realistic community involvement (Akabzaa 2000; Akabzaa, Seyire, and Afriye 2007; Salami 2001). S</p> <p>More generally the World Bank and other development institutions have supported the government in strengthening natural resource management and environmental challenges through the Natural Resources and Environmental Governance (NREG) programme.</p> <p>JC Rating -  Satisfactory –UMT is well aligned with environmental policies and regulations in Ghana</p>	
JC 1.3 Added value of Project Preparation Facility (PPF)	
JC Rating - Not applicable PPF not used	
JC 1.4 Complementarity with development partners operations and strategies	
<p>The World Bank⁵³ supported the Natural Resources and Environmental Governance Program Technical Assistance (NREGTA) operation for US\$5 million in FY13 that assists the GoG in addressing shortcomings in diversifying the mineral base and facilitating access to minerals, including support to tendering processes and infrastructure planning around non-gold deposits. It identified challenges in the management of the mining sector in Ghana include the tendering of some of the high-grade non-gold deposits in addition to the need to improve the artisanal practices of small scale miners whose growing activity, driven by rising international prices of gold, is having adverse environmental and social impacts.</p> <p>The environmental hazards and risks in mining are well known among development finance institutions, a number of which follow IFC's environmental standards for mining projects.</p> <p>JC Rating -  Satisfactory – UMaT is complimentary with development partners operations and strategies in the mining sector in Ghana.</p>	
JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts	
<p>The project document describes the development benefits that the project should bring in terms of what the laboratory will do. The expected outcomes and impacts are not clearly set out although they can be inferred. No intervention logic or theory of change is set out. It is, nevertheless, evident that the ESG benefits from the laboratory and training large number of mining engineers in environmental issues will be substantial. The appraisal report does not, however, analyse in sufficient detail SGS the international testing and certification company that is well established in Ghana and how the additional services the UMaT laboratory will offer will complement those of SGS.</p> <p>JC Rating -  Partly satisfactory While UMaT is expected to deliver significant development outcomes and impacts, appraisal documents do not include a cogent intervention logic.</p>	
EQ 1 Overall Rating –  Satisfactory The Environmental Monitoring Laboratory at UMaT is overall relevant to MFA policies in Ghana and fits well with the government's policy to ensure higher standards in the mining industry.	

EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p>Denmark has provided development assistance to Ghana since it gained independence in 1957. The project complies well with DSIF principles for project selection, most notably as Ghana is a low-middle income focus country, involves the supply of Danish laboratory and analytical equipment. Moreover, it fits well with Denmark's development strategy "The World 2030" for poor and more stable countries, with a focus on gradually shifting from development cooperation to increased political and commercial cooperation.</p>	

⁵³ The World Bank Country Partnership Strategy Ghana FY13-FY16 August 20, 2013

<p>As regards DSIF eligibility criteria the project was expected to:</p> <ul style="list-style-type: none"> • No be financially sustainable on commercial loan terms due to the uncertainty about revenues from student fees, consultancy activities and laboratory analytical income. • Contribute to upgrading environmental management and health & safety across the mining sector by providing qualified professionals and on-the-job training, as well as offering quality analyses and monitoring services to mining companies, general industry and public institutions. • Raise ESG standards that should improve living conditions in mining communities • Have demonstration ESG effects in other parts of the economy in Ghana. • Raise ESG standards in the mining industry regionally as a number of students and participants in training course will come from outside Ghana <p>JC Rating - –  Satisfactory Good coherence with MFA development policies and strategy</p>	
<p>JC 2.2 Synergies /complementarity with other Danish development initiatives</p> <p>Due to the unique nature of the project it was not expected to be complementary with other Danish development initiatives in Ghana. As noted, UMaT is well aligned with the Danida commitment to green growth in Ghana.</p> <p>JC Rating - Not applicable.</p>	
<p>JC 2.3 Danish business links with beneficiary countries</p> <p>It is expected that a significant amount of the laboratory and analytical equipment will be sourced by a Danish company, Desmi Contracting. Only part of the equipment was supplied by Danish manufacturers with the majority coming from other companies in Europe and Asia.</p> <p>JC Rating - –  Satisfactory</p>	
<p>EQ 2 Overall Rating -  Satisfactory UMaT fits well with the Danida commitment to green growth in Ghana and general project eligibility criteria, as well as Denmark's development strategy "The World 2030".</p>	

<p>EQ 5 Additionality</p>	<p>Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?</p>
<p>JC 5.1 Financial additionality of DSIF projects</p> <p>The project is sponsored by a university. While the new laboratory is intended it is intended to have revenues (from student fees, analyses it undertakes and from its other activities) there is a large degree of uncertainty as to whether they will be sufficient to cover its operating costs and deliver a return on the investment involved in its establishment. Consequently it is not bankable and only concessional financing from a development partner such as DSIF is appropriate. It is not possible to judge whether there were alternative funding sources. The financial additionality of DSIF support is evident.</p> <p>JC Rating –  Satisfactory – the environmental laboratory is sponsored by a university and has not been structured as a bankable enterprise. The financial additionality of DSIF concessional funding is evident.</p>	
<p>JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality</p> <p>JC Rating -  Partly satisfactory No non-financial additionality</p>	
<p>JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding</p> <p>JC Rating - Not applicable as the project is not structured as an enterprise and is therefore not bankable.</p>	
<p>EQ 5 Overall Rating –  Satisfactory the environmental laboratory (EL) is sponsored by a university and has not been structured as a bankable enterprise. Although it is unclear whether other sources of funding were available, it was appropriate for DSIF to support.</p>	

<p>EQ 6 - Effectiveness</p>	<p>What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?</p>
<p>JC 6.1 Satisfactory implementation of infrastructure projects</p> <p>The April 2021 field visit by Particip found that the laboratory had been in operation since 2019. Due to bureaucratic delays, that put the project eight years behind schedule, the laboratory is has equipment that was not the most modern and is not regularly calibrated. Obtaining Government approval to amend the specifications of the test and analytical equipment to meet modern standards would have further delayed implementation. As a result much of the equipment is obsolete. Machines have not been recalibrated since installation and lacks certification from Ghana and ISO standards board</p> <p>JC Rating –  Partly satisfactory While the laboratory is in operation the equipment is not certified and not the most modern. UMaT cannot provide all the services required by mining companies.</p>	

JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)

The appraisal divided EL services into three categories :

- Education (degrees etc) and research
- Consultancy work for mining companies, EPA and Minerals Commission Inspectorate Division
- Training and other services for local communities and interest groups


Outcome indicators were also specified:

- Number of students admitted to environmental engineering course sand to the environment department (annually)
- Number of students from other courses of study who received training in the Environment Department (annually)
- Number of analyses performed for external customers (annually)
- Income generated by consultancy work (annually)
- Number of research productions (annually)
- Number of government employees trained (annually)
- Number of people in the mining sector trained (annually)
- Number of external stakeholders, local communities and interest groups, trained (annually)

While these indicators are appropriate, they are generic and do not define, for example, the types of analyses undertaken or the different courses (from shorter training to full degrees). There are also no time bound outcome targets and against which outcomes can be assessed. No information on how the EL is operating is available.

Training of students and external courses also appear to be below expectations as the following data gathered during the field visit shows:

- 343 students annually accepted in the environmental engineering line and in the environmental department.
- 150 students from other lines receive education from the environmental department.

JC Rating -  Partly satisfactory - Appraisal report set out outcome indicators that were generic. Developmental benefits are likely to fall considerably short of what was expected at appraisal with relatively low testing volumes.

JC 6.3 Environmental, social and governance (ESG) risk management

The objective of the project is to improve ESG in the mining sector and, inter alia, raise the quality of living conditions in the communities they operate. The construction and operation of the EL itself were not expected to involve significant ESG risks and issues. Impacts during construction were assessed as insignificant, as the buildings already exist and the refurbishment is minimal. The main impacts and risks related to the operation of the laboratory were:

- Generation of waste water contaminated with chemicals that would have to be disposed of in accordance with EPA regulations.
- Generation of solid waste that may contain hazardous components.
- Risk of fire and explosion.


The working environment in the laboratory is subject to rules and procedures so that hazardous materials are used safely. The equipment for sampling and analysis of the following parameters, that are important for environmental monitoring of the mining sector were originally not included, but have been incorporated in agreement with UMaT:

- Free Cyanide, total cyanide and Weak Acid Dissolved Cyanide
- Acid base account, for the investigation of Acid Rock Drainage

The laboratory undertakes analyses to ensure that mining companies comply with, inter alia: have to comply with EPA environmental regulations, including:

- Environmental Assessment Regulation 1999 LI 1652.
- EPA act 1994, Act 490 Part II regarding chemical control and management.
- Radiation Protection Institutes Requirements 1993 LI 1550.
- EPA Environmental Quality Guidelines.






While the large formal mining companies generally comply with the environmental laws and regulations, small, informal miners do not and cause disproportionately high levels of pollution. A specific challenge for UMaT, that remains to be addressed, is how to reach small, informal miners.

JC Rating -  Satisfactory The objective of the project is to improve ESG in the mining sector and, inter alia, raise the quality of living conditions in the communities they operate. Within the laboratory the ESG issues to manage were not significant and related primarily to dealing with hazardous materials and samples that might contain cyanide and other toxic chemicals.

JC 6.4 Contribution to climate change mitigation, green and inclusive development

JC Rating -  Satisfactory The laboratory was established to raise ESG standards in the mining sector.


JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

JC Rating - N/A There are no specific climate related issues that conflict with the HP. The project was approved three years before HP..	
EQ 6 Overall Rating  Partly satisfactory. Poor definition of outcome targets and indicators as well as a lack on actual operations since completion in 2019. ESG issues appropriately addressed.	
EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)	
While a set of outcome indicators were set out in the appraisal report they were generic and not focused on what specific activities within the three categories (education, mining analyses and community services) were planned. Moreover, no outcome targets were set. Data on the project ended with the February 2019 Final Verification Note at project handover. The Particip field visit in April 2021 found that the laboratory is not operating in a commercial manner and is only generating revenues sufficient to cover the cost of consumables used in the equipment. JC Rating -  Unsatisfactory - the laboratory is not operating in a commercial manner and is only generating revenues sufficient to cover the cost of consumables used in the equipment.	
JC 7.2 Strong ESG performance of DSIF projects	
UMaT set up the EL is to deliver ESG benefits in the mining sector and, in the communities, when operate: <ul style="list-style-type: none"> • Improved environmental performance in the mining sector, leading to reduction in environmental degradation in mining communities and agricultural communities downstream mining areas; • Improved safety and working conditions, and therefore health and working capacity, for artisanal and small scale miners, many of them women. At UMaT currently only 17% of students are women. It is intended that will be a higher proportion of women students on EL courses. No information on EL operations post-handover is available. JC Rating -  Partly satisfactory While no information on EL operations post-handover is available, the planned contribution of UMaT to raising ESG standards in the mining	
JC 7.3 Satisfactory financial returns and portfolio performance	
The project is sponsored by a university and set up as a department within it, rather than in a company set up to commercialise the laboratory's services. While the new laboratory is intended it is intended to have revenues (from student fees, analyses it undertakes and from its other activities) the field visit found that they are currently only sufficient to cover the cost of consumables for the analytical machines and equipment. Staff costs, maintenance, building costs and overheads are all covered by UMaT. The laboratory is thus far from being financially viable. It is dependent on UMaT covering most of the operating costs, including staff salaries and overheads. JC Rating -  Unsatisfactory - The laboratory is not operating in a commercial manner and is only generating revenues sufficient to cover the cost of consumables used in the equipment.	
EQ 7 Overall Rating -  Unsatisfactory There is no focus on commercial outcomes. The laboratory is not being operated in a commercial manner and is only generating revenues sufficient to cover the cost of consumables used in the equipment. Instead it is a department within UMaT which pays for most of the operating cost, including staff, maintenance and overheads.	

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
The appraisal report on overall highlights the technical sustainability of the EL: <ul style="list-style-type: none"> • High potential demand for environmental monitoring services from the mining sector, notably the EPA requirement for monthly reports. • Ad hoc environmental consultancy work for mining companies, both for new projects and during their operations. • Community training in environmental monitoring and allied services The two key driving forces that it was assumed will make the EL an important and unique institution in Ghana are: <ul style="list-style-type: none"> • the environmental laws and regulations that are becoming increasingly stricter and • pressure from communities in mining areas and across the country for mining operations to be conducted in an environmentally sustainable way that reduces to a minimum adverse effects. 	

Despite there having been a good opportunity for the environmental laboratory to exploit, the practical implementation has been disappointing. Specifically, an appropriate structure in which the laboratory had autonomy to operate in a commercial manner was not set up. Instead the laboratory became another university department that was able to sell its services. Attracting staff to market and sell services was not possible because salaries were constrained by modest university pay scales. In other countries universities allow staff to set up commercial ventures in which the university may be a shareholder but which are run along commercial lines. This did not happen for the environmental laboratory, resulting in revenues falling below their potential levels. Moreover, there are no strategic or business plan setting out how the laboratory can grow and establish itself in an increasingly competitive market for analytical and testing services that is dominated by SGS, the global leader in the sector.


Although not directly relevant, in May 2021 the Environmental and Safety Engineering Department received a \$1.5m grant to study artisanal and small scale mining in Burkina Faso and Ghana⁵⁴.

JC Rating -  Unsatisfactory – the laboratory lacks the structure, commercial management and plans to achieve economic viability.

JC 8.2 Level of commercial/financial viability of infrastructure


As described in JC 8.1 the laboratory lacks the structure, commercial management and plans to be run as a commercial entity. It operates as a university department that tends to be passive rather than proactive in building a customer base and a solid source of revenues at levels that will enable it to cover not only its operating costs but sufficient cashflow to be able to properly maintain its equipment and invest in new equipment to maintain a competitive position.


It is also important to note that the analytical and test equipment has not been calibrated and that the laboratory does not have the requisite ISO certification, putting it at a major disadvantage to its principal competitor SGS.


JC Rating -  Unsatisfactory - The environmental laboratory is not run as a business and generates revenues that are too low to achieve commercial or financial viability.

JC 8.3 Level of improvements in ESG achievement



The laboratory has been designed to undertake analyses and testing that mining companies have to undertake to ensure continuing compliance with Ghana's environmental laws and regulations that are enforced by the EPA.




JC Rating –  Satisfactory – The likely improvements in ESG achievement are based on the planned contribution the EL can make to raising environmental standards in Ghana's mining industry.

EQ 8 Overall Rating -  Unsatisfactory – The laboratory was not established in a commercial way that makes it likely that it can be economically or financially sustainable. Instead as a department within UMAT it has failed to develop a business model to establish itself as a viable analytical and testing laboratory.

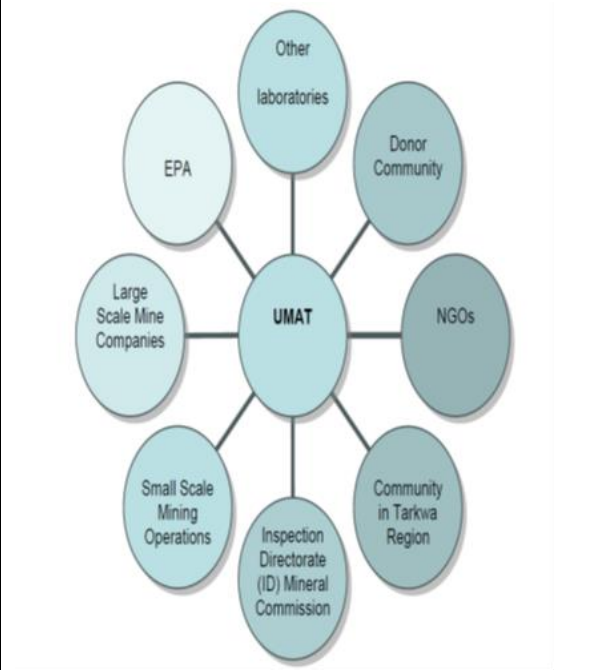
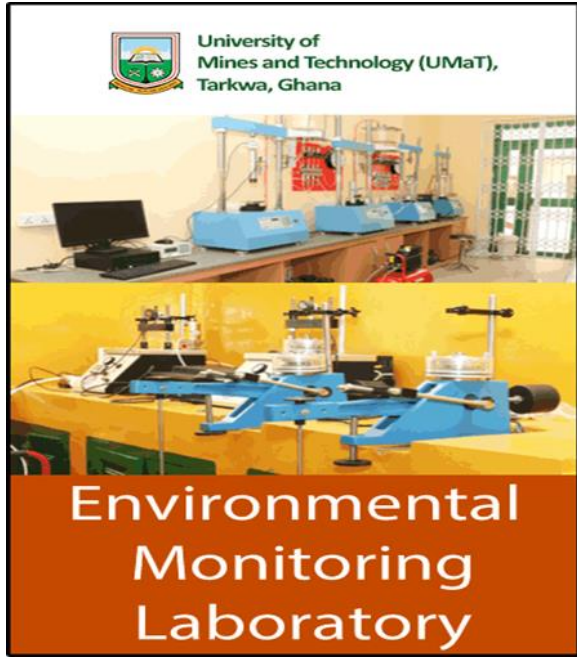
<p>EQ 10 Project risk management of DSIF</p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
<p>JC 10.1 Quality of risk management systems and policies on long-term sustainability</p>	
<p>Establishing the EL was relatively straightforward as it involved buildings into which, inter alia, laboratory equipment could be installed. In general, the assumptions and risks associated with the project, which are manageable by either UMaT and/or the project appear to be under control, and the risk that the project will be jeopardised is very low. The main assumption for the project is that there is a demand for the education, training and services that UMaT can offer as a result of the proposed new environmental monitoring laboratory. There is the risk that the demand for services to be offered by UMaT to the mining industry may decrease, as a result of a lowered activity level within gold and other minerals.</p>	
<p>What was not well addressed, however, was how the environmental laboratory could be run in a commercial way that would enable it to be financially sustainable without continuing support for its operating costs from UMaT.</p>	
<p>JC Rating –  Partly satisfactory - Implementation risks of setting up EL were low. Demand for services and development logic in AR were not well articulated.</p>	
<p>JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio</p>	
<p>Although the AR defined the following three categories of activity that EL was planned to undertake, there were no volume targets against which actual performance and outcomes could be judged :</p> <ul style="list-style-type: none"> • Education (degrees etc) and research 	

⁵⁴ <https://www.ghanaweb.com/GhanaHomePage/NewsArchive/UMaT-awarded-1-5m-grant-project-in-Artisanal-and-Small-Scale-Mining-1255090#>

<ul style="list-style-type: none"> • Consultancy work for mining companies, EPA and Minerals Commission Inspectorate Division • Training and other services for local communities and interest groups <p>A number of generic outcome indicators were articulated:</p> <ul style="list-style-type: none"> • Number of students admitted to environmental engineering course sand to the environment department (annually) • Number of students from other courses of study who received training in the Environment Department (annually) • Number of analyses performed for external customers (annually) • Income generated by consultancy work (annually) • Number of research productions (annually) • Number of government employees trained (annually) • Number of people in the mining sector trained (annually) • Number of external stakeholders, local communities and interest groups, trained (annually) <p>While these indicators are appropriate, they are generic and do not define, for example, the types of analyses undertaken or the different courses (from shorter training to full degrees). There are also no time bound outcome targets and against which outcomes can be assessed. The project approval states that: 'Information on installed capacity and number of personal days in which training has been carried out will be collected in connection with the commissioning of the project. UMAT will be responsible for providing annual information on the outcome indicators for the first five years after commissioning.' No such information has, however, been available. The latest report issued in the February 2019 Verification and Takeover report that dealt with the physical facilities and equipment financed.</p> <p>JC Rating  Partly satisfactory - Reporting frameworks not well defined. It was proposed that UMaT provide annual information on the outcome indicators for the first five years after commissioning although no such reports have been seen.</p>
<p>EQ 10 Overall -  Partly satisfactory - Results monitoring systems inadequate. It was proposed that UMaT provide annual information on the outcome indicators for the first five years after commissioning although no such reports have been seen.</p>

<p>EQ 11 Result management system</p>	<p>What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?</p>
<p>JC 11.1 Quality and appropriateness of RMS</p>	
<p>The project document describes the development benefits that the project should bring in terms of what the laboratory will do. The expected outcomes and impacts are not clearly set out although they can be inferred. No intervention logic or theory of change is set out. It is, nevertheless, evident that the ESG benefits from the laboratory and training large number of mining engineers in environmental issues will be substantial. There is no evidence of UMaT having provided DSIF with reports on its operations after the EL was commissioned that were envisaged in appraisal report.</p> <p>JC Rating –  Partly satisfactory - Although there are reporting requirements, there has been no information provided since 2019.</p>	
<p>JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio</p>	
<p>DSIF's focus post approval is on physical implementation. There has been no reporting after the verification and handover report issued in 2019. There is no evidence of UMaT having provided DSIF with reports on its operations after the EL was commissioned that were envisaged in appraisal report.</p> <p>JC Rating –  Partly satisfactory Reporting requirements are not been complied with.</p>	
<p>EQ 11 Overall Rating -  Partly satisfactory - Although there are reporting requirements, there has been no information on development outcomes since 2019.</p>	

Field visits and calls

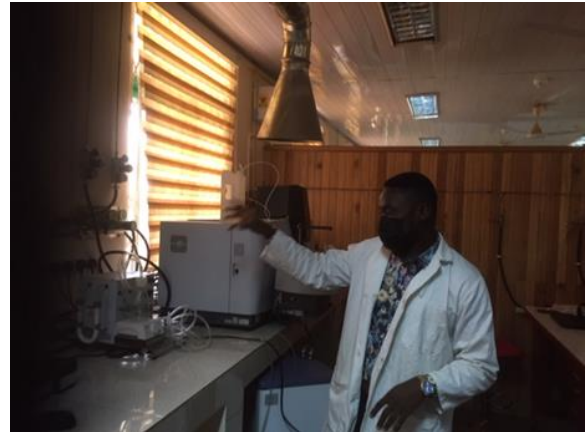


April 2021 Field Visit Photographs:

EML Building



Flame Photometer Laboratory



Spectroscopy Laboratory



Analytical Laboratory



Waste Water Laboratory



Water Quality Laboratory



Geotech Laboratory



7.1.1 DSIF UMaT Field Trip Report – Environmental Laboratory – University Of Mines And Technology Tarkwa By Ing Kwasi Agyei-Yeboah, National Expert Ghana

7.1.1.1 Key findings:

- The environmental laboratory (EL) started operations in 2019.
- The global inspection and testing company SGS which has been in Ghana for 60 years dominates the testing market⁵⁵. The fees charged by SGS are higher than UMAT but former is still capturing the market. It is unclear how UMaT can compete in a sustainable way with SGS.
- Due to bureaucratic delays, that put the project eight years behind schedule, UMAT has equipment that is reasonable but not the most modern. Some equipment is obsolete. Machines have not been recalibrated since installation; Certification from Ghana standard board is obsolete. Lack of certification is deterring clients from using the UMAT laboratories: ISO Certification and Ghana Standard Board Certification.
- The rationale for the EL is unclear, there is no business plan or model. Instead it operates on the basis of covering the cost of consumables as a university department. EL is not marketing its services.
- UMaT covers the cost of the five technicians and eight academic staff. Revenue streams are not encouraging.
- There are no funds or budget to replace equipment.
- Teaching appears limited to short courses for students studying engineering and mining, as well as for mining companies and other interested parties.
- According to users contacted:
 - rates fixed for EL services are neither high nor low – moderate
 - companies prefer using other laboratories with modern equipment
- Certification of each Equipment: No ISO Certification of lab. Operation is only based on British Standards, and American Standards, AASHTO.
- A lot of laboratories are springing up and prices are becoming very competitive.
- Small scale Miners are not ready to invest in mineral exploration and thus degrade lands prospecting for gold. UMAT should team up with EPA to assist these small-scale miners.

7.1.1.2 Introduction

- Wednesday 7th April 2021, set off at 5.30 am for the Two-day Field Visit to Tarkwa and arrived at the University of Mines and Technology, UMAT Tarkwa around 1.00 pm
- Was met by Mr. Cyril Opare, Administrator of the UMAT Laboratories who then sent me to the Director's office, Professor Newton Amegbey

7.1.1.3 DAY 1 - INSPECTION OF VARIOUS LABORATORIES AND INTERVIEW OF STAFF OF LABORATORIES AND SOME HEAD OF DEPARTMENTS

<i>Interview with Mr. Cyril Opare, Administrator, UMAT Environmental Laboratory</i>
<ul style="list-style-type: none"> • Was not involved in the initial stages of the DSIF UMAT Project • Environmental Laboratory was Operational in 2019 • 50% of UMAT students use the Laboratory at Subsidized rates • Rates fixed for the laboratories are neither high nor low - moderate • Revenues from laboratories are lodged in a Laboratory Account and used exclusively for the Operations of the laboratories. • Various Companies use the Lab. List already sent to us. • Not enough funds in account to replace Lab equipment. Only Consumables. • Some of the equipment are Obsolete because the procurement process was very long, hence Companies prefer using other laboratories with modern equipment • Revenues generated from Labs cannot procure Modern equipment
<i>Interview with Professor Newton Amegbey, Director of the UMAT Laboratories</i>

⁵⁵ It is part of the SGS is the world's leading inspection, verification, testing and certification company. According to its website: We are recognized as the global benchmark for quality and integrity. With more than 89,000 employees, we operate a network of more than 2,600 offices and laboratories around the world.

<ul style="list-style-type: none"> • Initiated DSIF Funding • There was a long delay in the process, 10years delay, mostly Political, from change in Government in Ghana • Thus, some equipment have become obsolete • It's too early for UMAT Lab to generate enough money to procure new equipment\ • Will still need external funding to procure any equipment • Revenues accruing from lab are used for consumables • Training of Environmental Engineers: not met the objective of the project. Lab is used to almost all students doing various courses at UMAT
<i>Tour of the Various UMAT Laboratory with Dr Ishmael Quaicoo, Deputy Director of the UMAT Laboratories and Matters arising</i>
Flame Photometer Laboratory: Interview with Senior Laboratory Technician, Mr. Emmanuel Quaicoo <ul style="list-style-type: none"> • There are Two main equipment for all heavy Metals Analysis, AAS Flame Photometer and VU for Mercury Analysis, HVG for Acetylene, Antimony etc. • Equipment Detects Light Metals in Dissolved Solutions: Sodium, Potassium, Calcium, Lithium etc. • Challenges: Intermittent Power supply disrupts lab processes hence has to use more gas than electricity which is a more expensive process. An ICP MS equipment will be preferred than the AAS. The ICP MS is an up to date and Very Current Modern Equipment
UV – VIS – NIR Spectrophotometer Laboratory: Interview with Lab Technician Mr. Isaac Agyarko and PHD Research Student Miss Linda Osei <ul style="list-style-type: none"> • SPLC EQUIPMENT IS USED FOR Separation of Compounds in Liquid Media: Proteins, Herbicides, Pesticides Pharmaceuticals etc. • Spectrophotometer determines Concentration in Samples. • Electro Spinner for Nanotech studies • Challenges: There are 3 off these machines and they are underutilized because most of the pharmaceutical industries are in the Free Zones enclave in Tema in the Greater Accra Region • Equipment Mainly used for Research Purposes which generates minimal revenue • Not getting many Clients • Two of these machines could have been replaced with a Scanner machine for Cyanide Analysis for the Mining Companies • Revenue obtained is used for Research & consumables and replacement of equipment is not possible
Waste Water Laboratory: Interview with the Principal laboratory Technician, Mr. Meshack Tei <ul style="list-style-type: none"> • Digest Samples for Analysis: BOD, COD Oil & Grease • Challenge: Air Science Fume extractor not functioning well because it was not made for strong acids. • Thus, Building a stronger Fume extractor at the back of the laboratory
Water Quality Laboratory: Interview with Senior Laboratory Technician, Mr. Prince Amoh <ul style="list-style-type: none"> • Tests conducted include total Coliforms, faecal coliforms and water pollution • Clients are Mining Companies for their Waste Water Effluents • Challenge: Not much engagement with Water Sachet producers to conduct water quality tests
Geology Laboratory Geo Tech 1): Interview with Laboratory Technician Mr. Endswell Cudjoe <ul style="list-style-type: none"> • Measuring balance working well, Soil Permeability equipment is working well • Dry Oven and Rock Direct Shear Box working well • 3 No Manual Oedometer working well and 2No. Automatic Odometer working well • Slake durability Working well • Manual and Digital Point Load all working well • Crushing Machine working well • Centrifugal machine faulty and has to be repaired • Challenges: all equipment are out of date and need to be recalibrated. • Since Installation of machines in December 2018 no re-calibration has been done
Geotech 2 Laboratory <ul style="list-style-type: none"> • CBR Equipment is working. Clients are road contractors • Soil Triaxial Equipment: Soil Direct Shear is not working. • Installation was done by WAGTECH but faulty • Rock Triaxial apparatus not yet delivered by Installers, WAGTECH • Some Equipment are obsolete and new ones needed
<i>Interview with Dr Ishmael Quaicoo, Deputy Director, UMAT Laboratories</i>
<ul style="list-style-type: none"> • Part of UMAT Laboratory since October 2014 • Aware of DSIF funding and it is a good venture • The setup is a heavy investment • Have Mobile Equipment for Field work with 4No. Mobile Vans

- Activities are: Air Quality Monitoring, Sampling, Gaseous Monitoring, Water & Soil Sampling Monitoring, Fumes from Cars, and Periodic Regulatory Monitoring (Once a Month) with 3No. Companies
- Training: developing short courses for Lab Management Practices, Instrumentation and Equipment Maintenance. Target groups are Research Institutions and various laboratories around
- Consultancies: currently running 3 to 4 No. for AngloGold Ashanti and Goldfields Ghana Limited
- Determination of Rates: Market Survey, Collect Invoices from various laboratories in Ghana and beyond. Finance Team analyse information determine rates
- Some Equipment are Obsolete and need replacement. If some equipment could be swapped with the GCMS equipment which is under utilized
- Seriously need the following equipment: XRD & XRF (for detection of Aluminium, Magnesium, silicon, Sodium, gold for WAD Cyanide, Free Cyanide and Total Cyanide, for the mining companies
- Prospective clients go to other laboratories because UMAT Lab equipment cannot detect some metals.
- Need a Zeta Sizer Equipment to measure PH
- Need Modern equipment that meets the needs of the communities around
- Revenue Generation is low and acquiring the XRF and XRD equipment would be the cash Cow. Revenues will increase DRAMATICALLY – for WAD Cyanide, Free and Total Cyanide tests in the Mining sector.

Interview with Professor Ewusi, Head of Geotechnical Department, UMAT and consultant to Intertech Company Limited

- Was not involved during initial process of the establishment of the DSIF UMAT Environmental laboratory
- Most of the Laboratory Equipment are working well although Modern types would have been better
- Automated 2D and #D equipment would have been preferred to 1D equipment. EM 34 Equipment is manual, not automated.
- New Equipment are really needed especially in the Geophysics lab
- Revenue streams are not encouraging
- Some Rates charged are higher than Outside Labs
- A lot of laboratories are springing up in the Locality which have better facilities
- ISO Certification is not done
- Laboratory Technicians should be adequately trained
- The laboratories lack the Business touch and should be made autonomous or a commercial entity should manage it
- The lab should be properly advertised to the public
- SGS Laboratories are taking lots of clients
- There is a need for Vibrancy in the UMAT Lab Management

Interview of Beneficiaries of the New Laboratory in Both Private and Public Sectors

Interview with Mr. Fred, Environmental Officer, AngloGold Iduapriem Mines, Tarkwa

- Laboratory is well set up
- Results obtained from Laboratory are Satisfactory
- Have a communication Problem – After samples were sent to UMAT lab, it took a week instead of normally, a day or two to get a response. You will have to be calling before you get your results.
- The AngloGold Environmental department is on Contract with the UMAT laboratories but former do not send third party samples to the latter
- Samples are rather sent to SGS Laboratories for Confirmation
- UMAT laboratory does not have the Scaler Equipment for WAD, Total and Free Cyanide but SGS has

Interview with Mr. Bright Arko, Inspector of Mines and Mr. Desmond Boateng, Principal inspector of mines, Minerals Commission, District Office, Tarkwa

- Not Conducted any lab tests so far at the UMAT Environmental Laboratory
- Professor Afram of UMAT was once contracted to do a Consultancy assignment for the Minerals Commission in Tarkwa
- Minerals Commission has its own laboratory at Takoradi
- The District Office deals with small scale Mining companies most of which have no formal Organisational structures. Cannot even locate their offices
- Their mandate is to register, process licensees & regulate small scale mining companies and stop illegal mining.
- Thus, do not take water samples to check level of Pollution to the environment
- Most of the small-scale miners do underground mining thus do not bring waste water to the surface. Waste water is recycled
- It is the small-scale miners who do alluvial mining who discharge effluent anyhow and degrade the lands. Thus, reclamation of devastated lands is urgently needed and Danida should assist.
- It should be noted that if there is any environmental challenge in the Community, UMAT is the first point of call.
- Thus, UMAT needs to do a lot of Marketing – Radio, TV and Social Media

Interview with Miss Esi Amoanyi, HSE QS Supervisor Maxam Company Limited, Tarkwa

- MAXAM Supply explosives for blasting in Rocks. This necessitates use of ammonium Nitrate and sodium nitrite as additives which generate effluents harmful to the environment. Thus, Maxam treats the Waste water and tests at UMAT lab before discharging water to the environment
- Been using UMAT Environmental lab since 2017
- Laboratory is Standard and Okay
- Lab fee rates are Okay. For the specific tests Maxam does, another lab charges trice that of UMAT lab: conductivity tests, Nitrates, PH, TDS etc.
- Maxam is currently building a new treatment plant to recycle waste water.
- Maxam has a Partnership with UMAT for the YES Program, (Young Engineers Program), where some students have their National Service at Maxam and after that sent to Spain for further training and employed by Maxam
- The Major Challenge with UMAT lab is Communication.
- Local training of Maxam staff is done by SGS Laboratories and HSE specifications by Minerals Commission for Certification
- UMAT not marketed themselves for training
- Most of Maxam National Service personnel are Graduates of UMAT

Interview with Mr. Edmund Nana Asare, Consultant to Air Liquid Company Limited, Lecturer & In Charge of Soil / Rock & Petrology Laboratory, UMAT

- Was around when laboratory was set up, that is the Installation Process.
- For the environmental lab, Installation was okay
- Geotechnical Lab Installation was Faulty – The rock triaxial equipment was supposed to be a Multi-purpose Equipment. The UCS Component is available but the Triaxial Component is not available.
- Some of the Software are not compatible with the Machine
- The installers did not have a Geotechnical Expert to set up the system
- After the Test run, UMAT reported these issues but problem is yet to be solved: Until the Soil Direct Shear is fixes, equipment cannot be considered as functional
- Certification of each Equipment: machines have not been recalibrated since installation; Certification from Ghana standard board is Obsolete. No ISO Certification of lab. Operation is only based on British Standards, and American Standards, AASHTO.
- Lack of certification is deterring clients from using the UMAT laboratories: ISO Certification and Ghana Standard Board Certification
- Other supplementary machines should have been part of the lab: Densometer, SPT Percussion and Rotary. These are Field machines which could have equipped the 4No. idling Mobile van and Land Cruisers for profitable field work
- Some companies rent equipment from individuals, who own their own equipment in UMAT, to do their tests at subsidized prices
- Air Liquid Ltd Supply Oxygen for medical laboratories. They only used lab once for Atterberg tests when building their Gas Plant.
- Rates Charged at lab are quite high compared to Ghana Highway Authority Materials laboratory. And SES, a Private Geotech company in Takoradi
- A lot of laboratories are springing up and prices are becoming very competitive. Thus, UMAT needs to do a lot of strategizing and marketing not forgetting Certification.
- Training of technicians is very important especially the young ones: How to operate machines, how to record test results and how to use Software
- WAGTECH, the installers of the machines are just installers and not trainers. Thus, the training they provided was woefully inadequate.
- Some of the training of the young one should be done overseas where machines originated from.

Interview with Mr. Moses Kpebu 2IC and Mr. George Nyamekye, Assistant Programme Officer, Environmental Protection Agency, District Office, Tarkwa.

- Not much Interface with UMAT Lab
- Only work together in terms of Research
- Expecting UMAT lab to do most of the Lab Tests and Analysis for the Mines in the Locality but have not been able to capture the market
- SGS is dominating the market now (the greatest competitor of UMAT lab)
- SGS has even opened a new lab in town to capture the water producers in Tarkwa although UMAT has a contract with the water producers
- Thus, UMAT should be up and doing. The business component of the UMAT lab is lacking although they have a lot of facilities and equipment
- Companies complain that samples sent to UMAT lab delays and thus turns them off
- A new strategy / marketing needed to revitalize the UMAT Laboratory
- EPA has its own laboratory but needs a reputable laboratory to do its third-party tests for its monthly monitoring returns

- However, EPA falls on SGS Lab for its third-party tests instead of UMAT Lab
- EPA formerly recommended UMAT for third party tests but latter failed to meet timelines.
- The fees charged by SGS are higher than UMAT but former is still capturing the market. This implies that UMAT Lab should be more business focused
- Consultancy; EPA wants small scale miners to stop using mercury (MINATA Convention) a technology introduced by the current Vice chancellor, Professor Amankwah
- EPA has not involved UMAT in Education Programs and should do so
- Small scale Miners are not ready to invest in mineral exploration and thus degrade lands prospecting for gold. UMAT should team up with EPA to assist these small-scale miners.
- UMAT trained small scale miners two years ago
- UMAT has to lead the way and engage other stakeholders and show their capacity for EPA to market them.
- Resource persons should be sent by EPA to teach UMAT Students through Industrial seminar

Telephone Interviews – Monday 12th April 2021

Interview with Mr. Kwabena Obo, Environmental Laboratory, Tarkwa Goldfields Company Limited

- Not Heard of name DSIF
- Been using UMAT Laboratory for the past two to three years
- Happy with all test results obtained from UMAT laboratory
- Not had any training at UMAT lab
- No concerns so far

Interview with Nana Amissah Chairman, Ghana National Association of Small-Scale Miners

- Has not heard of DSIF nor heard of the UMAT Laboratory
- Ministry of Mines & Technology has been organizing courses for members of the association in Mining Practices and Environmental issues periodically. The last one was organized two years ago
- Courses were organized at UMAT with resource persons from Minerals commission and lecturers in UMAT
- Surprisingly, unaware of the new environmental laboratory nor members patronized the laboratory
- Asked if member s will be willing to patronize the lab or need their services for a fee, Nana Amissah replied by saying UMAT has to engage them and educate them of their services before they can take a decision
- It is thus clear that UMAT lab has not engaged the Small-Scale Miners Association.

Interview with Mr. Samuel Anku, Manager, Dakate Small Scale Mining Company Ltd, Efua Anta, Tarkwa

- Heard of DSIF lab but has never used the Lab
- Recycles its waste water for the mercury so does not need testing of its waste water
- Asked if he will not need the UMAT Mobile Equipment to Prospect for Gold, Mr. Anku said UMAT did some on site demonstrations for them two years ago but has not heard from them again
- Moreover, he is now restructuring his activities so may use their services in future
- He is not aware of any of his colleagues using the services of UMAT Lab

Mrs. Ruth Achiaw, Superintendent, Environmental Department, AngloGold Iduapriem Mines, Tarkwa

- Already had a Contract with SGS before signing the two-year contract with UMAT for Selected Analysis
- Apart from Environmental Department, the Metallurgy and Geology Departments also use the UMAT Lab
- Environmental department only UMAT lab when the need arises

Mr. Abraham Badu, Manager, Metallurgy, AngloGold Iduapriem Mines, Tarkwa

- Have a contract with SGS (through a Competitive Bidding Process) for all their analysis; Geology and Metallurgy
- To win such a contract entails a lot: you must have high quality equipment
- UMAT, if interested will have to bid after the SGS Contract ends. There are normally advertisements in the Media.
- Contract with UMAT is with the University and not the laboratory and it is mainly for research purposes
- Have sent samples to the University for tests and results are good
- Does not have any challenge with UMAT

Debriefing Phone Interview with Professor Newton Amegbey after my Interviews with Various Stakeholders - Tuesday 13th April 2021

- Their laboratory equipment is top notch but modern equipment are available in the market which work better
- Cannot afford to buy any modern equipment now because they have to repay the loan facility
- ISO Certification is very expensive. Its only SSG who has it being an international Company
- Employed High Calibre Personnel for the Lab but they all left because of Low University Conditions of Service
- Existing staff lack the right calibre to operate in a business environment

<ul style="list-style-type: none"> • Admits that UMAT lab needs to be run business-like and communication and marketing functions improved. • Have a contract with Water Sachet Producers but they are not patronizing their facilities • SGS has set up e New Lab in Town and taken over the Sachet Producers market
<i>A Danino Skype call with Prof Newton Amegbey 14 April 2021</i>
<ul style="list-style-type: none"> • He was the inspiration behind the Env Lab (EL). SGS was judged to be providing poor service. It still dominates market • Procurement delays (8 years) was the biggest problem in the project due to 2 presidential elections that paralysed government • Not possible to change equipment ordered so some of it is out of date or not appropriate • Local contractor only 2 people not competent for project • No problems with way DSIF has acted • Business manager hired to commercial EL operations – left because of low salary • Need to set up EL as a commercial venture that could hire its own staff on market salaries • Plans to set up management board • At present EL part of university • No business plan or strategy/ budget • Dedicated bank account for EL but revenues are low and used to cover consumables • 2 main activities: <ul style="list-style-type: none"> ○ Env analysis ○ Rock and soil analysis • 5 technicians • 8 academic staff • Env course are modules for students on other engineering degrees • EL is passive in getting business has been in operation for 2 years • Only formal mining companies and other enterprises use EL. Informal miners do not use EL

8 Ghana: West African Fish

Overview

<i>Key issues, highlights and lessons learnt</i>
<ul style="list-style-type: none"> • WAF created 95 jobs, twice the level forecast in the appraisal report • WAF in 2020 produced 1,200 tons of tilapia, 120% of planned capacity • Covid restrictions prevented site visit


<i>Summary</i>	
Project name	West African Fish Limited (WAF)
Type of project	Private sector – agri-business
Project No.	no.104.O.30.Ghana
Description	<p>Unlike most DSIF projects this is a private sector project involving a SME start-up. Moreover, it is in agri-business.</p> <p>Private tilapia fish farm on southern edge of Lake Volta. West African Fish is a joint venture between the Danish Royal Danish Seafood Aquaculture A/S (RDS - 75%) and the Ghanaian agri-business company Palm Acres Ltd. (25%). RDS was already operating in aquaculture in Denmark and Montenegro. The main equipment (jetty, fish cages and fish breeding plant) was supplied by Danish company -European Aquaculture Aps.</p> <p>The project breeds and sell fresh tilapia, from the hatchery over the fingerling phase to grown up tilapias. The hatchery is a land-based facility, whereas growth of fingerlings to the grown up tilapia takes place in 32 net-cages floating on Lake Volta, anchored to a 300 metres long floating jetty.</p> <p>WAF grows tilapia with an average size of 500 gram (g), size range 350 to 600 g, based on own production of small fish (fingerlings) size 10-15 g, in the land based hatchery supported under the B2B program. Initially 3-4 million (5-15 g) fingerlings will be produced, enough for the expected output of 1.000 metric tonnes (mt) of tilapia.</p>

Summary																											
	<p>WFA constructed a 7 km road to the site from Akisumu, accessible by cars and small trucks. Lake Volta in eastern Ghana. The lake generates electricity, provides inland transport, and is a potentially valuable resource for irrigation and fish farming.</p> <p>Prior to the involvement of DSIF, in January 2008 WAF was provided with grants of DKK 9,4m by Danida's B2B⁵⁶ programme, in January 2008, to cover training (DKK 3.4 million) and ESG (DKK 5.7 million).</p>																										
Sector	Agri-business																										
Country	Ghana																										
Sponsor	WAF and Royal Danish Seafood																										
Other stakeholders	West Africa Fish Limited is a joint venture between Royal Danish Seafood Group A/S (RDS), with 75% of the equity and the Ghanaian company, Palm Acres Ltd., 25%.																										
Clearance in principle	November 2008																										
Approval/Binding Commitment	August 2009	Loan Agreement	11 September 2009																								
Danish Bank	Nordea Bank																										
Loan Duration + Grace Period	Loan amount: EUR 1,132,000 10 year loan, repayments starting in April 2010																										
Project Amount and funding plan	<p>Project budget DKK 25,5m (US\$4,6m) (exchange rate DKK/USD 5,56), of which a contract is expected to be concluded with a Danish supplier worth approx. EUR 8,9 million. The total project investment is expected to be as follows (DKK million):</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;"><i>Funding source</i></th> <th style="text-align: center;"><i>DKKm</i></th> </tr> </thead> <tbody> <tr> <td>DSIF</td> <td style="text-align: right;">8,88</td> </tr> <tr> <td>B2B</td> <td style="text-align: right;">5,37</td> </tr> <tr> <td>Shareholder Loan RDS</td> <td style="text-align: right;">8,99</td> </tr> <tr> <td>Equity</td> <td style="text-align: right;">2,22</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">25,46</td> </tr> </tbody> </table> <p>The Danish contract financed by a mixed credit is expected to be distributed as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" style="text-align: center;"><i>EUR million</i></th> </tr> </thead> <tbody> <tr> <td>Construction work (buildings and basins)</td> <td style="text-align: right;">2,44</td> </tr> <tr> <td>Cages and nets</td> <td style="text-align: right;">4,14</td> </tr> <tr> <td>Generators</td> <td style="text-align: right;">0,23</td> </tr> <tr> <td>Både, spare parts, etc.</td> <td style="text-align: right;">2,07</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">8,88</td> </tr> </tbody> </table>			<i>Funding source</i>	<i>DKKm</i>	DSIF	8,88	B2B	5,37	Shareholder Loan RDS	8,99	Equity	2,22	Total	25,46	<i>EUR million</i>		Construction work (buildings and basins)	2,44	Cages and nets	4,14	Generators	0,23	Både, spare parts, etc.	2,07	Total	8,88
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	Royal Danish Seafood the principal shareholder sourced equipment primarily from Denmark and Norway.																										
MFA guarantee	Date	Amount	Duration																								
Implementation status	Project completed and in operation at the end of 2010. Loan fully repaid.																										
Feasibility study details	Production and sale of Tilapia in Ghana, Royal Danish Seafoods Aquaculture A/S in co-operation with Palm Acres Limited Ghana, September 2007																										
Subsidy – rationale and key features		<i>DKKm</i>	<i>USDm</i>																								
	Total	3,90	0,70																								
	Interest subsidy	1,56	0,28																								
	EKF prize:	0,00	0,00																								
	Bank margin:	0,06	0,01																								
	Extra cash gift amount:	1,45	0,26																								
	Technical assistance, etc.:	0,18	0,03																								
	Budget margin 20%:	0,65	0,12																								

⁵⁶ Replaced in 2011 by Danida Business Partnerships facility

Summary	
Country Context	<p>The period from 2007 to 2011 was characterized by sustained growth of the Ghanaian economy, peaking with a 14% growth in 2011. The growth in this period was largely driven by the oil and gas sector. Together with a rebasing of the country's GDP, this resulted in Ghana advancing from a low-income country to lower middle-income country classification in 2011.</p> <p>Agriculture (including fisheries) has long been an important sector of the economy contributing with around 43% of GDP in 2007 and employ about 55% of the labour force in Ghana. Cocoa is the major export crop, followed by timber and non-traditional products such as horticulture, fish/sea foods and pineapple. Fish production over the last decade has been fluctuating annually with a mean value of about 400.000 metric tons, with 20% from inland fisheries, nearly all of which is from Lake Volta.</p> <p>From a structural economic perspective, Ghana has not yet succeeded in bringing domestic demand in line with domestic production, by diversifying exports and by increasing agricultural production and productivity. The structure of the Ghanaian economy today is still very similar to the one inherited at independence in 1957 in relation to production capabilities of local firms; narrowness in terms of the basket of exports and their complexity; and thin in terms of linkages within the economy among domestic producers of intermediate goods and services.</p>





Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The <u>Ghana Joint Assistance Strategy (G-JAS) 2007-2010</u>⁵⁷ set out commitments by development partners including Denmark partners to work toward the Ghana Poverty Reduction Strategy II goals. Under Pillar 1: (Private Sector Competitiveness PSD/Trade to improve Ghana's access to regional and global markets and improve the business and investment climate for private sector investors.), Denmark committed to support objective 1; Enhance the competitiveness of the private sector. WAF aligns well with this objective as it is the first aquaculture project in Ghana to be built and operate to international standards.</p> <p>At a more strategic level, Ghana has been a focus country for Danish development cooperation for more than 50 years. Even though it was reclassified from a low to low-middle income country in 2011, its GNI per capita of about USD 1.500 at the time of the project was still under half the DSIF limit of USD 3.895.</p> <p>The project meets Danida's overall objective of poverty reduction, as the project provides the basis for economic growth through the improvement of the income base and employment for local people. WAF is located on the southern edge of Lake Volta in a rural area. WAF was sponsored and set up by a Danish aquaculture company (RDS) that will bring its expertise to the project.</p> <p>The direct effect on employment was planned to be 40-50 new jobs, in communities around the site of the production facilities. With very few opportunities in these areas for wage employment, the project has an important positive impact, not least for the younger people of the communities. The value added contribution and hence the contribution to accelerated economic growth could be increased, if feed of sufficient quality was available in Ghana, but this is not the case at present.</p> <p>JC Rating -  - Satisfactory – Project well aligned with DSIF eligibility criteria and overall Danida policy in Ghana.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	
<p>A number of policies and national strategies in Ghana specifically set out policies and objectives that cover, inter alia, the development of aquaculture in Ghana⁵⁸.</p> <p><u>2000 Ghana Fisheries Act</u> –aquaculture identified as an alternative to fish imports; the target is to produce 100,000 MT by 2016⁵⁹.</p> <p><u>2008 National Fisheries and Aquaculture Policy</u> – the goal was to enable Ghana take advantage of its biophysical and socio-economic environment; strong research capacity; to significantly bridge the huge gap between national fish demand and supply in the medium term.</p>	

⁵⁷ Specific bilateral Denmark Ghana cooperation was only agreed later with the Denmark-Ghana. Partnership Policy 2014-2018

⁵⁸ Asian Journal of Fisheries and Aquatic Research, Ghana's Fisheries Policies; Evolution and Performance, June 2020

⁵⁹ The Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic Ocean (ATFALCO) - Fishery and aquaculture industry in Ghana, October 2012

<p><u>The Fishing Sub-Sector and Ghana's Economy, Bank of Ghana - September 2008</u> – sets out the case for the Ministry for Fisheries to focus on aquaculture given the fact that the country abounds in numerous dams and dugouts as well as rivers, which make aquaculture fishing feasible countrywide. It concludes that 'In particular, fish farming based on contemporary technology is a growing area of interest that needs to be explored, be it in the area of fresh water farming or aquaculture based on ponds and reservoirs, or marine.'</p> <p><u>Republic of Ghana Fisheries and Aquaculture Sector Development Plan 2011-2016</u> set out a number of targets including:</p> <ul style="list-style-type: none"> • Maintaining capture fisheries production at current levels, • Increasing revenue and profitability in capture fisheries by at least US\$ 50 million a year after five years, • Increasing aquaculture production to 35.000 tons a year after five years.□ <p><u>Ghana National Aquaculture Development Plan (GNADP) March 2012</u> proposes that two '...interrelated objectives would be accomplished within the medium term:</p> <ul style="list-style-type: none"> • Increase the commercial output of farmed fish produced from 10.200 tons in 2010 to 100.000 tons by the end of 2016; • Improve and assure the environmental sustainability of aquaculture production and fish health as well as the social acceptability of aquaculture-products. <p>It can be seen that WAF aligns strongly with government policy for aquaculture in Ghana.</p> <p>JC Rating -  - Satisfactory – Project well aligned with national development policies and strategies.</p>	
<p>JC 1.3 Added value of Project Preparation Facility (PPF)</p> <p>PPF not used JC Rating - not applicable</p>	
<p>JC 1.4 Complementarity with development partners operations and strategies</p> <p>In 2011 the World Bank, committed \$54m to a fisheries programme in Ghana⁶⁰. Component 4 of the project supported:</p> <ul style="list-style-type: none"> • Aquaculture Development (US\$8,0 M) • Catalysing aquaculture development for medium and large scale enterprises US\$1,1 M • Small scale aquaculture development US\$5,0 M <p>This project is complementary to WAF as it will strengthen the enabling environment.</p> <p>JC Rating -  - Satisfactory – Clear complementarity with WB support for aquaculture development in Ghana.</p>	
<p>JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts</p> <p>In the AR in section 15 (meeting Danida's objectives of economic and social development) it is stated that the project '... creates income and employment and hence makes a contribution to economic growth. The direct effect on employment is around 40-50 new jobs, which give employment opportunities to unemployed persons from the informal sector in the communities around the site of the production facilities. With very few opportunities in these areas for wage employment, the project has an important positive impact, not least for the younger people of the communities. The value added contribution and hence the contribution to accelerated economic growth could be increased, if feed of sufficient quality was available in Ghana, but this is not the case at present.'. The AR conclusion is that the project can contribute substantially to development through technology transfer, job creation and economic growth.</p> <p>Section 16 Project Monitoring Indicators, however, does not analyse well outcomes, focusing on fish pricing and the marketing benefits and not on the planned development outcomes. No DAC compliant outcome indicators are defined, even though they are evident from the analysis in section 15.</p> <p>JC Rating -  - Partially satisfactory. While the development outcomes are not difficult to identify and quantify, the AR does not analyse them in a coherent way.</p>	
<p>EQ 1 Overall Rating –  - Satisfactory – This private sector aquaculture start-up in a rural part of Ghana is developmentally strong. It is coherent with Danida's overall objectives in Ghana and aligns closely with the government policies to expand aquaculture in Ghana.</p>	


EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	

⁶⁰ World Bank: Project Appraisal Document - Ghana Project as part of the West Africa Regional Fisheries Program June 17, 2011

Denmark has provided development assistance to Ghana since it gained independence in 1957. The 2018 evaluation of Evaluation of the Ghana – Denmark Partnership found that in the 2007 to 2017 period, private sector development (PSD) had been one of the main areas of cooperation in the alongside general budget support, governance, health and tax/customs. The evaluation found that: 'As regards the Danish support to private sector development, the lack of a clear sector implementation strategy or policy dialogue has made it difficult to contribute to fundamental changes within this sector. On the other hand, at enterprise level, there are indications that Danida's support has resulted in many successful projects with potential for up-scaling.' WAF clearly falls under the category of projects with potential for up scaling.

Danida's support for PSD is listed in the Ghana Joint Assistance Strategy (G-JAS). Commitments by partner (including Denmark) to work toward GPRS II goals and harmonization principles. 2007. This document is a multi-donor cooperation strategy that was still in force at the time of WAF.


The project complies well with DSIF principles for project selection, most notably as Ghana is a low-middle income focus country, involves the transfer of technology from an established Danish aquaculture company, creates jobs and growth in a rural area and is in sector which is strategically important to the government. Moreover, it fits well with Denmark's development strategy "The World 2030" for poor and more stable countries, with a focus on gradually shifting from development cooperation to increased political and commercial cooperation.

JC Rating -  - Satisfactory coherence with MFA development policies and strategy.

JC 2.2 Synergies /complementarity with other Danish development initiatives

WAF was provided with grants of DKK 9,4m by Danida's B2B⁶¹ programme, in January 2008, to cover training (DKK 3,4 million) and environmental safeguards (DKK 5,7 million - wastewater treatment and water circulation facilities, as well as occupational safety and health, women and workers' rights).


Danida's private sector development support in Ghana has been complimentary and includes co-chairing the Private Sector Development (PSD) Working Group with the Ministry of Trade and Industry from 2010 to 2016, Danida has been a driving force in the efforts to coordinate the debate and influence the dialogue on PSD policy and implementation issues⁶².


JC Rating -  - Satisfactory - DSIF followed on from earlier B2B support to WAF and is complimentary to general Danida support to private sector development in Ghana.

JC 2.3 Danish business links with beneficiary countries

Royal Danish Seafood with a 75% stake in WAF is an experienced Danish aquaculture company. It has one of the world's largest and most responsible onshore aquaculture facilities for raising eels⁶³. As well as WAF, it has an aquaculture farm in Montenegro. It was founded in 2000.

The project uses equipment nets, cages and other equipment brought in from Denmark and Norway where fish farming has a long history.

JC Rating -  - Satisfactory - Project sponsored by experienced Danish company Royal Danish Seafood





EQ 2 Overall Rating -  - Satisfactory WAF aligns well with Danish development policies, and its development strategy in Ghana. This private sector aquaculture start-up is controlled by the experienced Royal Danish Seafood.



EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
According to the AR: ' The question is if the mixed credit is necessary for the investment to take place? Firstly, the investors have started to invest in the production and sale of tilapia. This indicates that they are willing to undertake the investment. Secondly, the financial benefit for WAF Ltd. is only the subsidy element of the mixed credit – the credit will have to be repaid in full during the next 10 years under normal terms. The subsidy element (USD 0,56 million) of the credit amounts to one year of net profit after tax, i.e. would there not have been a subsidy element and the credit instead given under normal commercial conditions, the accumulated net profit would turn positive after 4 years instead of after 3 years. ...	

⁶¹ Replaced in 2011 by Danida Business Partnerships facility

⁶² Evaluation of the Ghana – Denmark Partnership (2007- 2017) - Results, sustainability and transformation 2018 – page 53

⁶³ [http://royaldanishfish.com/aquaculture-\(1\).aspx](http://royaldanishfish.com/aquaculture-(1).aspx)

<p>It could be argued that the level of interest would have been higher had the credit not been provided through a mixed credit arrangement. However, there is room for a significantly higher commercial rate of interest to be charged within the scope of the subsidy element of USD 0.56 million, where the upfront grant account for more than USD 0,3 million and the interest only account for about USD 0,26 million: The level of interest should be 7,75%⁶⁴ should the interest payment be equivalent to the subsidy element. An alternative model would thus be that a commercial loan on normal conditions is taken, e.g. organised by Royal Danish Seafood and guaranteed by IFU. With the good prospects of a positive net profit, the investment might still be undertaken.'</p> <p>It is therefore evident that the project was going ahead with or without DSIF. As stated, the concessional nature of DSIF funding is beneficial, especially during the early years of a new enterprise when there are most likely to be delays and problems that were not anticipated.</p> <p>JC Rating -  - Partially satisfactory –financial additionality limited to concessional nature of DSIF support. WAF would have been implemented without DSIF funding.</p>
<p>JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality</p> <p>DSIF requires its projects to meet international ESG standards, as set by IFC. This is important for a fish farm where potential adverse ESG effects are significant.</p> <p>JC Rating -  - Satisfactory - DSIF's ESG conditions provide significant non-financial additionality.</p>
<p>JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding</p> <p>Indicators:</p> <ul style="list-style-type: none"> • Ratio of mobilisation at project level of DSIF funding to commercial funding sources. • Ratio of mobilisation at project level of DSIF funding to development sources <p>No mobilisation of other funding.</p> <p>JC Rating -  - Unsatisfactory – A private sector project such as WAF is an opportunity for DSIF to use its blended finance to bring in other funding. This did not occur.</p>
<p>EQ 5 Overall Rating -  - Partially satisfactory Limited additionality primarily through the project being built to international standards and following DSIF ESG standards. Project was going ahead with or without DSIF funding.</p>

<p>EQ 6 - Effectiveness</p>	<p>What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?</p>
<p>JC6.1 Satisfactory implementation of infrastructure projects</p>	<p>This fish farm is an agribusiness project. Completion occurred rapidly one year after approval and operations began in 2010. Evaluation interviews with the managing director of WAF confirmed that the fish farm was still in operation. It was not possible to visit WAF because of Covid restrictions.</p> <p>JC Rating -  - Satisfactory</p>
<p>JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)</p>	<p>The most important and evident outcome is the creation of 40-50 new jobs, which is especially important given the rural location of the project at the southern end of Lake Volta. According to the 2013 completion report⁶⁵ a total of 47 jobs were created 6 for women and 41 for men. The MD of RDS and WAF stated that WAF currently employs 95 people⁶⁶, double the 2013 number.</p> <p>An important indirect outcome is the expected demonstration effect of a modern fish farm operating to international standards. Technologically and environmentally the project contributes to the development of the aquaculture sector in Ghana. As part of the project there was a programme to undertaking 370 days of training. In addition to this on-the-job-training has been carried out both by the WAF management and the international day-to-day managers that have been assigned throughout the period of the project. The project was expected to contribute to employment for women in particular, who are typically responsible for the sale of fish on local markets.</p> <p>JC Rating -  - Satisfactory Between 95 jobs were created twice the number expected in the AR. Other development outcomes related to the establishment of a modern fish farm meeting international technical and environmental standards that has a demonstration effect for the overall aquaculture sector in Ghana.</p>
<p>JC 6.3 Environmental, social and governance (ESG) risk management</p>	<p>The lake area used for cages is about 600m into the lake, and 1.000 m wide to the North and South. An environmental impact assessment (EIA) was prepared requiring WAF to meet a number of environmental protection requirements, in Ghana The Ghana Environmental Protection Agency issued the required environmental permit in June 2008</p>

⁶⁴ I.e. higher than the interest on the overdraft facility that Royal Danish Seafood is using to provide finance to WAF Ltd. during the initial years.

⁶⁵ 2013 June Final Completion Report Draft End of defects notification report WAF 28 06 2013

⁶⁶ RDS email 31 May 2021

The key ESG issues that require regular monitoring are:


- Discharges of waste water from the hatchery into the lake
- Decomposition of uneaten fish food in the cages that can lead to phosphorus and nitrate build up in the water around and sediment under the cages.
- Excretions (faeces) by the growing fish.
- The land area leased for the production is uncultivated land.
- All water from the recirculated systems and the tanks with hormone treatment should be filtered before discharge.

DSIF made it a requirement that during the first two years of production WAF report on:

- Analyses of bottom sediments from below the cages after harvesting,
- Analyses of waste water for hormones before discharge from the fish breeding tanks.

A positive social impact that was identified related to several illegal settlers on the project site who were offered a small sum of money to relocate, and settled a few hundred meters just outside the boundaries. Two of them, both men, were offered and accepted jobs at the site.

The Skype interview with RDS revealed that water pollution and fish diseases has been a continuing problem for the farm, resulting in the significant death rates from time to time.

JC Rating -  - Satisfactory ESG issues handled appropriately. WAF committed to regular monitoring of environmental compliance in particular related to water quality around the cages during operation.


JC 6.4 Contribution to climate change mitigation, green and inclusive development


No climate change mitigation issues identified.

JC Rating -  - Satisfactory Provided that environmental compliance during operation is undertaken then they should contribute to green and inclusive development.

JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

JC Rating - not applicable as project was approved in 2009.


EQ 6 Overall Rating -  - Satisfactory WAF delivered positive development outcomes, most importantly in the creation of 95 jobs in a rural part of Ghana. ESG issues properly assessed in AR. WAF committed to regular monitoring of environmental compliance in particular related to water quality around the cages during operation.

EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?																				
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)																					
WAF created 95 jobs within the AR target of 40 to 50. The fish farm has exceeded the tilapia production targets as the table below shows.																					
	<table border="1"> <thead> <tr> <th>Year</th> <th>Capacity MT p.a.</th> <th>Production MT p.a.</th> <th>Utilisation%</th> </tr> </thead> <tbody> <tr> <td>2009</td> <td>1.000</td> <td>480</td> <td>48%</td> </tr> <tr> <td>2010</td> <td>1.000</td> <td>858</td> <td>86%</td> </tr> <tr> <td>2011</td> <td>1.000</td> <td>1.119</td> <td>112%</td> </tr> <tr> <td>2020</td> <td>1.000</td> <td>1.200⁶⁷</td> <td>120%</td> </tr> </tbody> </table>	Year	Capacity MT p.a.	Production MT p.a.	Utilisation%	2009	1.000	480	48%	2010	1.000	858	86%	2011	1.000	1.119	112%	2020	1.000	1.200 ⁶⁷	120%
Year	Capacity MT p.a.	Production MT p.a.	Utilisation%																		
2009	1.000	480	48%																		
2010	1.000	858	86%																		
2011	1.000	1.119	112%																		
2020	1.000	1.200 ⁶⁷	120%																		
Based on the completion report, it is clear that the sponsor Royal Danish Seafood implemented the project as planned. The Skype interview with the founder and managing director of both RDF and WAF confirmed that WAF continues to operate and employs 95 people. Nevertheless, WAF faces continuing challenges including fish diseases in the lake and competition from imported fish that have to be overcome to maintain the development outcomes that have been achieved.																					
JC Rating -  - Satisfactory development outcomes notably job creation significantly above planned levels were achieved.																					
JC 7.2 Strong ESG performance of DSIF projects																					

⁶⁷ RDS email 31 May 2021

As well as Ghana EPA rules, WAF agreed to compliance with EU regulations. Although it took time for analyses of sediments under the fish cages to be undertaken, the completion report⁶⁸ a sample taken and submitted for testing in June 2012 and results indicate that sedimentation below and around the cages is not a problem and that pollutant levels were within permitted ranges. A sample of discharge water from the fish nurseries analysed in February 2013 tested for the hormone testosterone and concluded that there were no significant discharge of this hormone into Lake Volta. The situation has, however, changed since then. In March 2021 the MD of WAF informed Particip that it faces continuing environmental challenges including fish diseases in the lake. WAF has from time to time suffered significant losses in its fish pens.


While there is no information on the social issues such as working conditions, the AR highlighted that the minority Ghanaian partner in WAF Palm Acres is well established in Ghana and operates several forestry and farming enterprises (including aquaculture) and does thus have considerable experience in employing workforces. Its managing director is a renowned farmer and was in 2007 named "Best Farmer in Ghana".


JC Rating -  - Partly satisfactory - ESG performance up until completion in 2013 was good. Analyses of sediments below the fish cages and water discharges from the fish nurseries revealed no pollution concerns. Since then pollution in the lake has led to significant fish deaths.




JC 7.3 Satisfactory financial returns and portfolio performance

No information on the financial and operating performance of WAF. It is therefore not possible to assess the financial returns and whether they met the targets included in the AR. It showed a 11,6% financial rate of return but highlighted a number of uncertainties most importantly that the largest item of variable costs is imported feed. According to RDS⁶⁹ WAF is now using locally produced feed. On the revenue side of the business, the analysis of the expected sales price was superficial.

In summary, it is not possible to assess WAF's profitability and financial viability, other than to state that even if the farm was working well delivering the expected quantities of tilapia, it was vulnerable to higher imported feed costs and/or lower sales prices.


JC Rating -  Partly satisfactory. There is a lack of information on WAF's financial performance. The business is vulnerable to higher imported feed costs and/or lower sales prices as well as from time to time significant deaths in its fish stocks.




EQ 7 Overall Rating  Partly satisfactory Based on data up to 2011, WAF appears to have started well and delivered anticipated development outcomes and mixed ESG performance, with pollution an issue in Lake Volta. There is a lack of information on WAF's financial performance.


EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>The 2013 completion report noted that ' The overall impression is that the farm now is fully operational with hatchery, nursery and fingerling facilities well established supplying the now 80 cages (48 large and 32 smaller cages) in the lake. Production is steadily increasing and exceeded that target for the project... the 32 cages are in full operation and being maintained with spare parts procured under the mixed credit as well as from additional procurement of spare parts. Installed capacity of 1,000 tons/year was well exceeded in 2011 with a production of 1.119 tons.'</p> <p>WAF is still operating in 2021 and has 95 employees. In 2020 it produced 1.200 tons. Although due to Covid restrictions it was not possible to visit the fish farm, the fact that it has been operating for 10 years indicates economic viability.</p> <p>JC Rating -  Satisfactory – WAF was set up and operations began broadly as planned in 2010. It has created 95 jobs and continues to operate 10 years later, indicating that it is economically viable.</p>	
JC 8.2 Level of commercial/financial viability of infrastructure	
<p>JC Rating -  Satisfactory – There is a lack of information on WAF's financial performance. WAF is now using locally produced fish feed that eliminates its vulnerability to cedi depreciation on its operating costs. It has, however, operated for 10 years and has fully repaid the Nordea Bank loan.</p>	
JC 8.3 Level of improvements in ESG achievement	
<p>Analyses in 2013 of sediments taken from under the fish cages in the lake and water discharges from the fish nurseries did not exceed permitted levels. WAF complied with its ESG commitments. The MD, however, informed the evaluators that pollution and diseases in the lake caused by other fish farms are affecting WAF's operations.</p> <p>JC Rating –  Partly satisfactory – ESG performance up until completion in 2013 was good but WAF is being affected by pollution and diseases caused by other fish farms on Lake Volta.</p>	


⁶⁸ West African Fish Project Ghana - Verification at the end of Defects Notification and Final Completion Report - June 2013


⁶⁹ RDS email 31 May 2021

EQ 8 Overall Rating -  Satisfactory – WAF started well and in the early years of operation was economically, socially and environmentally sustainable. WAF fully repaid the Nordea loan, indicating financial viability.

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
JC 10.1 Quality of risk management systems and policies on long-term sustainability	
<p>The AR highlighted the following risks:</p> <ul style="list-style-type: none"> AR - Conflicting socio-economic interests among local stakeholders may impede on the project due to a number of factors beyond control of the project. However, the risk can be mitigated if the existing close cooperation is maintained and expanded with the Chiefs, local authorities, the District Assembly and the communities. A major risk on the financial side was the risk of a Cedis devaluation, because of the major weight in the variable costs of imported feed. <p>Project implementation risk was not judged to be significant since construction was well under way when DSIF became involved.</p> <p>JC Rating –  - Satisfactory The key operational risks that could adversely affect sustainability were identified and appropriate mitigation measures proposed.</p>	
JC 10.3 Quality of environment, social and governance (ESG) risk management	
<p>Three categories of ESG were considered in the AR:</p> <ul style="list-style-type: none"> pollution in Lake Volta from fish nursery water discharges and/or sediments under the fish cages contaminated from fish excretions and uneaten fish feed. WAF committed to strong environmental management procedures including analyses of discharge water and sediments. Diseases in the fish cages due to stocking at high densities. Enforcement of existing rules and regulations relating to the Lake Volta is described as one of the most difficult aspects of the lake governance in the WAF project area. <p>As noted above, exogenous pollution is adversely affecting WAF operations and killing fish stocks.</p> <p>JC Rating –  - Satisfactory approach to identifying and managing ESG risks.</p>	
<p>EQ 10 Overall Rating –  - Satisfactory Operational and ESG risks at WAF were well analysed and appropriate mitigation approaches conceived. A major risk is cedi depreciation that no longer exists is the dependence on expensive imported fish feed. Pollution risks in the lake have been well managed so that it is not an issue.</p>	

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
<p>The overall development logic in the AR is clear: establishing a tilapia fish farm built and operated to international standards that would create jobs and other benefits for the rural communities at the southern edge of Lake Volta where it is located.</p> <p>What is less well set out and defined are the project output and outcome indicators. The target of 40 to 50 jobs is shown as an output and not an outcome indicator. The outcome indicators refer to the need for a marketing strategy and monitoring the prices at which the fish is sold, neither of which is meets the DAC definition of an outcome indicator. Insufficient attention has been given to defining quantifiable outcome indicators (beyond jobs) that can be used to assess WAF's development effectiveness.</p> <p>JC Rating –  Partly satisfactory – . Insufficient attention has been given to defining quantifiable outcome indicators (beyond jobs) that can be used to assess WAF's development effectiveness.</p>	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>The only appropriate outcome measure set out in the AR is job creation for which there is a clear target. No other outcome indicators were formulated that could enable DSIF to track the development results being delivered by WAF. Furthermore reporting ended in 2013 with the issue of the completion report. No data is available of the performance of WAF since then.</p>	

JC Rating --  Partly satisfactory – The only appropriate outcome measure set out in the AR is job creation for which there is a clear target. Reporting to DSIF ended in 2013 with the issue of the completion report. No data is available of the performance of WAF since then.

EQ 11 Overall Rating -  Partly satisfactory – The overall development logic in the AR is clear: establishing a tilapia fish farm built and operated to international standards that would create jobs and other benefits for the rural communities at the southern edge of Lake Volta where it is located. Insufficient attention, however, was given to defining quantifiable outcome indicators (beyond jobs) that can be used to assess WAF's development effectiveness.

Field visits and calls

Photographs from June 2013 Completion Report



Pic. 1: Cages from lake side



Pic. 2: Feeding of Tilapia in cage

8.1.1.1 Note on Proposed Field Visit

RDS, the majority shareholder of WAF, was contacted to arrange a field visit. Particip was informed that due to the Covid pandemic in Ghana a field visit was not possible as it would pose too high a risk for the employees of WAF. Instead Skype interviews were held with, and information obtained from:

- the founder and managing director of RDS in Denmark who set up WAF and remains closely involved in its operations.
- Ghana Chamber of Aquaculture

Case study: Kenya

9 Kenya: Thika and Githunguri Water and Sanitation Improvement


Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> • Implementation is at an early stage. Design consultants are being appointed. • Ambitious project to provide water and sanitation to fast growing towns on the outskirts of Nairobi. The sponsor, Athi Water Works Development Agency, and the two existing, well established water companies are suitable partners. • Feasibility study was 75% funded by PPP. • Other TA includes twinning with Danish water companies. • Good coherence with DSIF strategic priorities. 	

Summary			
Project name	Thika and Githunguri Water and Sanitation Improvement Project (TGWSIP)		
Type of project	Water and sanitation		
Project No.	PID 9024 / F1745-1		
Description	<p>Project was identified during a marketing trip to East Africa in 2015, along with similar project in Uganda. TGWSIP aims at securing the future water supply and sewage treatment for the rapidly growing Thika and Githunguri towns in the northern outskirts (30 to 40 km away) of Nairobi, Kenya with populations of 210.000 (about 60.000 households) and 14.000 that are expected to double in size to about 400.000 and 30.000 inhabitants over the next 20 years.</p> <p>In Thika, the project intends to expand the water treatment capacity of the central water treatment plant from 36.000 to 56.000 m³/day and rehabilitate and extend the water reticulation network. In addition, the project intends to establish three sewage treatment plants of 23.000, 17.000 and 7.000 m³/d, and to establish sewage collection systems accordingly and augment the current system that covers only a small part of the town.</p> <p>In Githunguri, the project intends to establish a 5.000 m³/day water treatment plant, and a 2.900 m³/day sewage treatment plant, as well as rehabilitation and expansion of water reticulation net-work and a new sewerage system.</p> <p>Both projects involved integrated water and sewerage systems. Raw water for both projects will come from nearby rivers. In addition, the Githunguri system was supplemented by bore holes.</p>		
Sector	Water and sanitation		
Country	Kenya		
Sponsor	Athi Water Works Development Agency (AWWDA), one of the eight Water Development Agencies under the Ministry of Water and Sanitation.		
Other stakeholders	Beneficiaries: Thika Water and Sewerage Company (THIWASCO) and Githunguri Water and Sanitation Company (GIWASCO) that report to AWWDA.		
Clearance in principle	18 December 2018		
Approval/Binding Commitment	31/7/2020	Loan / Investment Agreement Date	
Danish Bank			
Loan Duration + Grace Period	Standard 10 year loan planned		
Project Amount and funding plan			

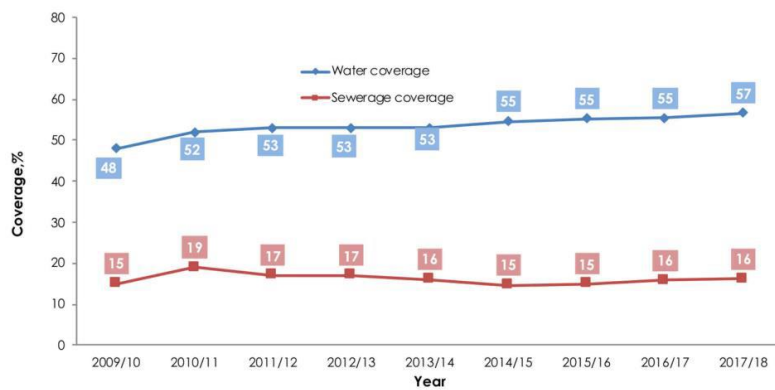
Summary																																													
			DSIF	Gov	Total																																								
			DKKm	DKKm	DKKm																																								
			Output 1. WTP and WS network	432,0	432,0																																								
			Output 2. Sewerage and STPs	371,4	371,4																																								
			Output 3. WatSan informal settlements	4,1	4,1																																								
			Output 4. Biogas, hydropower and solar energy	32,9	0,0																																								
			Land acquisition and compensation	0,0	1,6																																								
			Construction supervision and PMU	28,5	0,0																																								
			Contingencies (15%)	114,0	0,6																																								
			VAT	70,2	70,2																																								
			Total budget (excl. TA)	1.049,1	76,5																																								
				1.125,6																																									
			<i>Thika</i>	890,4	65,4																																								
			<i>Githunguri</i>	158,7	11,2																																								
				955,8	169,8																																								
Danish Exporter																																													
MFA guarantee	Date		Amount		Duration																																								
Implementation status	A memorandum of understanding between Ministry of Finance and DSIF is under preparation. Athi is currently preparing the tender documents for the design/supervision consultants with support from the DSIF.																																												
Feasibility study details	DKK 5.25m approved in May and June 2017. DBF contribution of DKK5m equivalent to max of 75% of FS cost with rest from AWWDA. Feasibility Study dated 19 August 2019, funded by DSIF prepared by NIRAS A/S and Losai. Includes ESIA.																																												
Subsidy – rationale and key features	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><i>Million DKK</i></th> <th style="text-align: right;"><i>Thika</i></th> <th style="text-align: right;"><i>Githunguri</i></th> <th style="text-align: right;"><i>Total</i></th> </tr> </thead> <tbody> <tr> <td>Loan amount</td> <td style="text-align: right;">734,8</td> <td style="text-align: right;">130,7</td> <td style="text-align: right;">865,4</td> </tr> <tr> <td>Cash grant element of loan</td> <td style="text-align: right;">155,9</td> <td style="text-align: right;">27,7</td> <td style="text-align: right;">183,6</td> </tr> <tr> <td>Interest subsidy</td> <td style="text-align: right;">119,6</td> <td style="text-align: right;">21,3</td> <td style="text-align: right;">140,9</td> </tr> <tr> <td>Margin to Danish lending bank</td> <td style="text-align: right;">10,4</td> <td style="text-align: right;">1,9</td> <td style="text-align: right;">12,3</td> </tr> <tr> <td>Grant excl. TA and margin</td> <td style="text-align: right;">285,9</td> <td style="text-align: right;">50,8</td> <td style="text-align: right;">336,8</td> </tr> <tr> <td>Technical Assistance</td> <td style="text-align: right;">19,9</td> <td style="text-align: right;">3,5</td> <td style="text-align: right;">23,4</td> </tr> <tr> <td>Budget margin</td> <td style="text-align: right;">97,3</td> <td style="text-align: right;">17,3</td> <td style="text-align: right;">114,6</td> </tr> <tr> <td>DSIF Total grant</td> <td style="text-align: right;">403,1</td> <td style="text-align: right;">71,6</td> <td style="text-align: right;">474,7</td> </tr> <tr> <td><i>DSIF subsidy excl. budget margin</i></td> <td style="text-align: right;"><i>305,8</i></td> <td style="text-align: right;"><i>54,3</i></td> <td style="text-align: right;"><i>360,2</i></td> </tr> </tbody> </table> <p>Concessionality: 35%</p>					<i>Million DKK</i>	<i>Thika</i>	<i>Githunguri</i>	<i>Total</i>	Loan amount	734,8	130,7	865,4	Cash grant element of loan	155,9	27,7	183,6	Interest subsidy	119,6	21,3	140,9	Margin to Danish lending bank	10,4	1,9	12,3	Grant excl. TA and margin	285,9	50,8	336,8	Technical Assistance	19,9	3,5	23,4	Budget margin	97,3	17,3	114,6	DSIF Total grant	403,1	71,6	474,7	<i>DSIF subsidy excl. budget margin</i>	<i>305,8</i>	<i>54,3</i>	<i>360,2</i>
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Country Context	Kenya is a lower middle income country with a diversified economy that is the largest in east Africa. After services, the most important economic sectors are agriculture (24% of GDP - principal cash crops are tea, horticultural produce, and coffee), manufacturing (14%) and tourism (9%) It has been a priority country for Denmark. Over 2015-2019, economic growth averaged 5,7%, making it one of the fastest growing economies in Sub-Saharan Africa. While the country is generally stable and peaceful, corruption continues to hamper its development. The population of 48 million is growing at 2,2% putting strain on natural resources and on services such as WatSan in towns and cities. The largest city and capital is Nairobi with a population of 4,4 million. The Nairobi metropolitan region, that includes Thika and Githunguri, has a population of over 10 million. Thika is on the major A2 highway to northern Kenya and has become an important commuter town.																																												

9.1 Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?																								
JC 1.1 Alignment with MFA development policies and strategy																									
<p>Both the AR and the project document discuss the alignment of the project with MFA development policies and the Denmark Kenya country strategy. Danida has supported management and reforms of Kenya's natural capital base especially in the sectors of water, environment and agriculture since the early days of engagement with Kenya. In the Denmark – Kenya Partnership Policy 2015-2020 , strategic focus area number 1 (Implementing the constitution towards a prosperous and equitable Kenya) states that '...access to energy and water and improved natural resource management are crucial for growth and a critical factor for improving livelihoods. The project is also consistent with Strategic focus area 2 - inclusive green growth and employment. The WatSan challenges in Kenya are highlighted in the new Denmark – Kenya Strategic Framework 2021-2025 it is 'Insufficient urban water supply as well as structural water shortages and fluctuation in arid and semi-arid lands mean that over 13 million Kenyans lack access to clean drinking water and 19 million to sanitation....Also relevant is provision of water and sanitation in line with SDG 6, which will be considered in the context of the bilateral development programme and Danida Sustainable Infrastructure Finance, as well as local initiatives that can help Kenya adapt to climate change in line with SDG 13.</p> <p>The AR sets out, inter alia, the following 'strategic considerations to justify the support:</p> <ul style="list-style-type: none"> • GoK's strong demand for the projects, and their alignment with national and local plans, provide a strong foundation for results and sustainability. • They (the two sub-projects) directly operationalize the Danish priorities on water and sanitation, leading to clear and measurable development results in this area. By building on the developing partnership between DSIF and the key Kenyan water authorities, they give Denmark access to knowledge and networks in the water and sanitation services sector to the benefit of the wider Danish engagement in Kenya and to Denmark's global priorities on water and sanitation. • The projects represent good opportunities for putting the DSIF instrument with its special feature to best use; tailored to public infrastructure projects, typically in urban/peri-urban settings, often in the water/sanitation sector.' <p>TGWSIP fits well with Danida's 2017 The World 2030 - Denmark's strategy for development cooperation and humanitarian action that has as one of its four strategic aims: 3. Inclusive, sustainable growth and development. Denmark will invest in inclusive, sustainable growth and development in the developing countries, focusing on energy, <u>water</u>, agriculture, food and other areas where Denmark has special knowledge, resources and interests.</p> <p>JC Rating -  Satisfactory – good alignment with MFA development policies and strategy</p>																									
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account																									
<p>The 1999 National Water Policy set a target of access to safe water for everyone in Kenya by 2010 the country's population by 2010 with a less ambitious goal for sanitation. The table⁷⁰ below taken from the project document shows that these goals have not been achieved.</p> <table border="1"> <thead> <tr> <th>Indicator</th> <th>Status 2014/15</th> <th>Goals (NWSS)</th> <th>Goals 2030 (Vision 2030)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>Water Coverage</td> <td>55%</td> <td>80%</td> <td>100%</td> <td rowspan="2">This is for areas covered by commercialised utilities</td> </tr> <tr> <td>Sewerage Coverage</td> <td>15%</td> <td>40%</td> <td>100%</td> </tr> <tr> <td>NRW</td> <td>43%</td> <td><30%</td> <td><25%</td> <td>The indicator has not recorded significant improvement despite the commercialisation of services</td> </tr> <tr> <td>O+M Cost Coverage</td> <td>99%</td> <td>100%</td> <td>150%</td> <td>150% is a proxy measure for full cost coverage</td> </tr> </tbody> </table> <p>Recent responsibilities for water and sanitation (WatSan) are defined by the Water Act of 2002. This set up large regional water service boards with full responsibility for service provision, including asset ownership and development. The National Water Services Strategy (2007-2015) had three main goals which were improvement of access, reduction of water losses (NRW) and improvement of sustainability (seen in terms of cost coverage). It was noted that in urban areas, population growth is outpacing the coverage of water and sewerage services in urban areas⁷¹ as the following chart shows.</p>		Indicator	Status 2014/15	Goals (NWSS)	Goals 2030 (Vision 2030)	Remarks	Water Coverage	55%	80%	100%	This is for areas covered by commercialised utilities	Sewerage Coverage	15%	40%	100%	NRW	43%	<30%	<25%	The indicator has not recorded significant improvement despite the commercialisation of services	O+M Cost Coverage	99%	100%	150%	150% is a proxy measure for full cost coverage
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⁷⁰ Water Service Regulatory Board (2016): A Performance Review of Kenya's Water Services Sector 2014 – 2015

⁷¹ WASREB: Impact. A Performance Report of Kenya's Water Services Sector 2018/19 (2019). Page 11.



A revised Water Act was enacted in 2016 that sets the institutional context for TGWSIP. Within government it mandated the Ministry of Water and Sanitation (MSS) to oversee and regulate the sector. It has the responsibility, inter alia, to prepare the National Water Resource Strategy. In addition, and of direct relevance to the project there is the Ministry of Water and Sanitation - Strategic Plan 2018 – 2022 issued in December 2018 which included the following strategic objectives

- To increase per capita fresh water endowment from 527 M³ to 700 M³ through management, protection and conservation of water resources by 2022.
- To increase percentage of national population with access to safe water from 60% in 2017 to 80% by 2022
- To increase percentage of national population with access to improved sanitation from 68% in 2017 to 80% by 2022

It can be seen that TGWSIP is consistent with national development policies and strategies

JC Rating - ● Satisfactory – Good alignment with both the 2016 Water Act and the MSS Strategic Plan 2018 – 2022.

JC 1.3 Added value of Project Preparation Facility (PPF)

DKK 5,25m approved in May and June 2017. DBF contribution of DKK5m equivalent to max of 75% of FS cost with rest from AWWDA. Total cost €0,75m. Feasibility Study dated 19 August 2019, prepared by NIRAS A/S and Losai (local consultants). Principal tasks set out in contract for FS:

Task 4 – feasibility study

Task 5 – Environmental and social impact assessment (ESIA)

Task 6 - resettlement action plan

Although AWWDA had already prepared a FS a number of key issues were not well addressed, most notably the management of water resources. Thika Water accesses a river that is used by many farms, plantations and commercial users. In the dry season there may not be sufficient water to meet the demands of all users. The FS was therefore required to ensure that the project met international standards.

JC Rating - ● Satisfactory – DSIF conditioned its support of the project on there being a comprehensive FS to international standards that, inter alia, addressed fully key technical issues, most importantly the management of water resources. Its use of the PPP to fund 75% of the cost of the FS was appropriate and necessary.

JC 1.4 Complementarity with development partners operations and strategies

Among development partners (DPs) there is and has been widespread support for water and sanitation projects in Kenya. Given this widespread interest the Government and DPs coordinate cooperation through the Water Sector Working Group, that is chaired by Ministry of Water and Sanitation in which the Danish Embassy is a member. The support of key DPs is summarised below.

- The AfDB⁷² Kenya Country Strategy Paper 2019-2023 there is under Strategic Pillar I – (Supporting industrialization cost of doing business reduced through infrastructure development) a section on water and Sanitation and its commitment to supporting 'Access to clean environment and adequate safe drinking water and sanitation enhanced.' Projects supported by AfDB include:
 - 2013 Water Supply and Sanitation Project: This invested US\$ 27 million to support the improvement of water supply and sanitation services in urban, peri-urban and rural communities in and around Nakuru in the Rift Valley.
 - Kenya Towns Sustainable Water Supply & Sanitation Program.
 - Thwake multipurpose water development program
 - Nairobi Rivers Rehabilitation and Restoration Program- Sewage Improvement Project Phase
- The World Bank⁷³ 2014-2018 Country Strategy Paper set out a target to '... ramp up its already considerable support to public-private partnerships, especially in the energy, water, and transport sectors


⁷² African Development Bank Group – Kenya Bank Group Country Strategy Paper 2019-2023

⁷³ World Bank WB 2014-2018 Country Strategy Paper June 2014

where there is medium-term potential.’ It noted that Kenya’s large cities are engines of growth and the urbanization trend is unstoppable, so improving access to water and transport services in urban areas will be key. Projects supported by WB include:

- \$200m 2015 Water Security and Climate Resilience Project that ‘...helps set a sound institutional and investment framework to reduce vulnerability of the country and the poor segments of its population to these events \$200m in FY15
- \$300m 2017 Water and Sanitation Development Project to improve water supply and sanitation services in select coastal and north-eastern regions in Kenya.
- One of AFD’s⁷⁴ objectives in Kenya is ‘...securing water supply and sanitation - In the face of growing urbanization, AFD is supporting government measures to ensure that urban populations have access to more reliable water services. In the three largest cities (Nairobi, Mombasa and Kisumu) it supported the strengthening of drinking water production and distribution facilities, sewage treatment and the optimization of network management by the operating companies (we intervened in the);
- KfW⁷⁵ has funded infrastructure to increase access to safe, affordable and adequate water. It also supports the Water Services Trust Fund by providing funds for the construction of water kiosks and public sanitation facilities, reaching over 1,4 million people so far.
- Sida⁷⁶ also supports the Water Sector Trust Fund, which increases access to clean water and sanitation in Kenya, both in rural areas and in cities.
- Japan⁷⁷ assistance policy in Kenya is to enhance cooperation to capacity development of water utilities in addition to development of water infrastructure, both in urban and rural areas.

The DSIF project is complementary to the activities of other DPs. Through the government/donor Water Sector Working Group in which the Danish Embassy is a member coordination is ensured.

JC Rating -  Satisfactory – The project is clearly complementary with support provided by other development partners.

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

TGWSIP aims at securing the future water supply and sewage treatment for the rapidly growing Thika and Githunguri towns in the northern outskirts (30 to 40km away) of Nairobi, Kenya with populations of 210.000 (about 60.000 households) and 14.000 that are expected to double in size to about 400.000 and 30.000 inhabitants over the next 20 years. Githunguri and especially Thika (45km to the north-east) are part of Nairobi metropolitan region which has now grown to over 10 million as the urbanisation of Kenya continues. WatSan in these towns is old and there has been insufficient investment in expanding its provision in line with rapid population growth. The intervention logic set out in the AR and project document set out appropriate outcome targets and indicators as set out below.

Outcome 1	Households, industries and other consumers in Thika and Githunguri have improved access to clean and affordable water.		
Outcome indicator	Number of people in the project area having improved access to clean piped water from the new project		
Baseline	2019	0	0
5-year Target	2029	223.000 people	20.000
End target	2044	253.000 people	31.000
Outcome 2	Reduction in wastewater released to the environment		
Outcome indicator	Quantity of wastewater (m ³ /day) collected and treated by the new STPs		
Baseline	2019	0	0
5-year Target	2029	17.000 m ³ /day	1.000 m ³ /day
End target	2044	47.000 m ³ /day	2.900 m ³ /day
Outcome 3	Demonstration of the use of energy saving and renewable energy in water production and wastewater treatment		
Outcome indicator	Reduction of the grid energy used for water and wastewater treatment (MWh/year)		
Baseline	2019	0	
5-year Target	2029	5.451 MWh p.a.	318 MWh p.a.
End target	2044	5.451 MWh p.a.	318 MWh p.a.

The baselines do not, however, take account of the existing (albeit old and obsolete) WatSan services. Also, impacts in terms of improved quality of life and healthcare not discussed, perhaps because they would be more difficult to measure and are long term in nature.


⁷⁴ <https://www.afd.fr/en/page-region-pays/kenya>


⁷⁵ <https://www.kfw-entwicklungsbank.de/International-financing/KfW-Development-Bank/Topics/Water/>

⁷⁶ <https://www.sida.se/en/sidas-international-work/kenya#development-0>

⁷⁷ <https://www.jica.go.jp/kenya/english/activities/activitiy01.html>

Despite this, it is clear that a thorough project identification, assessment (feasibility study) and appraisal process was followed to ensure that the project was properly analysed and set realistic development outcome targets and output goals.

JC Rating -  Satisfactory – TGWSIP was properly identified and assessed as a project with the potential to deliver high development effectiveness.

EQ 1 Overall Rating –  Satisfactory : Water and sanitation is a strategic and policy priority for both Kenya and Denmark/DSIF. The Thika and Githunguri Water and Sanitation Improvement Project is an example of a well selected integrated WatSan project in two towns that are gradually becoming part of metropolitan Nairobi and which are growing rapidly and where existing, old infrastructure can only cater to decreasing proportion of the population. Thika is on the major A2 highway to northern Kenya and has become an important commuter town. TGWSIP fits well with both the policies of Danida and DSIF in Kenya and supports well the Ministry of Water and Sanitation - Strategic Plan 2018 – 2022. The use of the PPP to fund the FS was critical to ensure that water resource management was properly addressed.

EQ 2 -Coherence To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?

JC 2.1 Systematic research for coherence with MFA development policies and strategy

The 2020 project document states that DSIF ‘ contributes indirectly to poverty reduction by contributing to sustainable and transformational change in developing countries in line with the SDGs, by softening the terms of commercial loans for investments primarily in public infrastructure. The projects should be based on local demands and development challenges, in line with the partner countries own development strategies and sector plans.’ The present project is clearly within this vision:

- Both Thika and Githunguri contribute to increasing the coverage with clean water and sewerage, and are thus a contribution to the achievement of the Government of Kenya’s stated goals in this respect;
- They contribute indirectly to poverty reduction by providing access to water and sewerage, which is important for economic activity and inclusive economic growth.’

In addition TGWSIP clearly meets, inter alia, the following eligibility criteria:

- Kenya is a focus country with GNI per capita below USD 3,895 (2019)
- WatSan is a sector where there are Danish companies that are internationally competitive -
- Strong alignment with Sustainable Development Goal 6 (SDG 6) on water and sanitation,
- Aligned with Denmark Kenya country framework Strategic objective 1: Green, sustainable and inclusive growth
- Project size: minimum size of DKK 100 million. Upper limit depends on budget available.

JC Rating -  Satisfactory -Strong coherence with both eligibility criteria and MFA policies in Kenya.

JC 2.2 Synergies /complementarity with other Danish development initiatives


In the Denmark-Kenya Partnership 2021-2025, approved in 2019, Strategic objective 1: Green, sustainable and inclusive growth states ‘Denmark seeks to promote green, sustainable and inclusive economic growth and decent jobs with an emphasis on youth as well as market opportunities for Danish companies and investors with relevant solutions...Preserving biodiversity and using natural resources sustainably, including water, to increase their contribution to economic growth and livelihoods of future generations constitute another central principle.’ In addition the \$60m Danida 2010-2014: Natural Resource Management Programme which is still in operation, focuses on ‘... is the reduction of poverty through the sustainable management of natural resources.’ The DSIF project complements well the NRMP.


JC Rating -  Satisfactory – There is good complementarity with the overall Denmark Kenya partnership and specific Danida programmes such as the NRMP.




JC 2.3 Danish business links with beneficiary countries

The water sector is one of the two focus sectors for DSIF. As shown in China and Vietnam there are a number of internationally competitive Danish companies that can build and operate water and sanitation infrastructure. The AR notes that ‘...Kenya’s economic growth has led to an increasing interest from Danish companies, even if from a low starting point. Kenyan demand for solutions in the areas of water supply, renewable energy, infrastructure, health, pharmaceuticals and agribusiness corresponds to what Danish companies can deliver. ...The present project shall be seen in this context, and taking into account the long history of Danish cooperation, including within the water and sanitation sector, there is a solid resource base in Denmark, which can be drawn upon for this project.’



In the AR it is proposed that TA during implementation include twinning arrangement between Athi Water Works Development Agency and Danish water companies (probably included under Capacity building TA for AWWDA) to ensure that appropriate operations and maintenance systems are set up in both the Thika and Githunguri water companies.

JC Rating -  Satisfactory – While Danish business links in Kenya are at an early stage, the strong capability of Danish water companies is expected to deliver significant benefits to TGWSIP as well as good business opportunities for Danish companies as happened in China and Vietnam.




EQ 2 Overall Rating -  Satisfactory – TGWSIP fits well both with the overall Denmark Kenya cooperation framework and DSIF eligibility criteria. Water and sanitation is one of the two priority sectors for DSIF and as shown in China and Vietnam there are a number of internationally competitive Danish companies that can build and operate such infrastructure.





EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?		
JC 5.1 Financial additionality of DSIF projects			
With the exception of VAT, the project is 100% funded by DSIF. No other development institutions are involved. Financial additionality arises principally from the subsidy that is equivalent to an OECD limit of 35% for a low middle income country. The subsidy components are listed below			
Million DKK	Thika	Githunguri	Total
	DKKm	DKKm	DKKm
<i>Loan amount</i>	734,8	130,7	865,4
Cash grant element of loan	155,9	27,7	183,6
Interest subsidy	119,6	21,3	140,9
Margin to Danish lending bank	10,4	1,9	12,3
Grant excl. TA and margin	285,9	50,8	336,8
Technical Assistance	19,9	3,5	23,4
Budget margin	97,3	17,3	114,6
DSIF Total grant	403,1	71,6	474,7
The major components for the subsidy can be seen to comprise the 21% cash grant element of the loan, followed by the interest subsidy. TA is required to ensure that post completion the infrastructure is properly operated and maintained.			
A subsidy is required due to the water and sanitation charges being at a level that households can afford to pay and which are too low for either water company to service commercial loans.			
JC Rating -  Satisfactory – Financial additionality is principally in the form of a subsidy package which is necessary due to the low tariffs that the two water companies charge.			
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework') additionality			
Non-financial additionality is provided by DSIF in three forms:			
<ul style="list-style-type: none"> • TA in the project preparation. DSIF funded a detailed feasibility study to that was completed in 2019 that ensured the project was designed and implemented to international standards. • As part of the feasibility environmental and social impact assessments (ESIAs) for both sub-projects, As result, both the Thika and Githunguri projects will have to comply with national, international and IFC ESG standards. • TA during implementation to train staff at the Thika and Githunguri water companies in the operation and maintenance of the facilities being constructed. This will include twinning arrangements with Danish water companies. 			
JC Rating -  Satisfactory – Strong non-financial additionality in the form of commissioning the feasibility study, adherence to international ESG standards and training of staff to operation and maintain the facilities.			
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding			
No commercial or development bank funding mobilised.			
JC Rating - n/a			
EQ 5 Overall Rating –  Satisfactory – Good financial additionality through a subsidy package that should ensure repayment of loan. Strong non-financial additionality in the form of commissioning the feasibility study, adherence to international ESG standards and training of staff to operation and maintain the facilities.			

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
The project was approved in July 2020. A loan agreement is still to be signed and a tender to select contractor to build the water treatment plants is yet to occur.	
JC Rating – n/a	

JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)
<p>According to the AR- 'TGWSIP directly support SDG6 (water, sanitation) and will have important indirect effects on SDG3 (health), SDG4 (education), and through these, SDG8 (jobs, incomes), SGG11 (sustainable cities), and SDG16 (democracy, justice) – and not least SDG1, poverty.' Based on current populations, 250.000 people, industries and institutions in Thika Town and 31.000 in Githunguri Town will have improved access to clean and affordable water and be connected to piped sewerage.</p> <p>The Project will result in both direct and indirect benefits to the residents of Thika and Githunguri in terms of:</p> <ul style="list-style-type: none"> • A steady and sufficient water supply. It is important to note that the project has been designed to allow for the rapid growth of Thika and Githunguri over the next 30 years. • Improved access to clean and reliable water. • Improved health by reduced waterborne diseases and better hygiene due to improved sanitation. • Reduced pollution of river systems due to sewage systems to all dwellings and businesses in the two towns . • Other positive impacts of the Project include the creation of job and business opportunities for the local communities during the construction phase. In the long run it is expected that the improved situation will trigger the development of modern infrastructure, especially in town areas due to the availability of sewer infrastructure. <p>It is also important to consider the project in the context of the continuing growth of the Nairobi metropolitan region that has expanded to encompass Thika which although 45km north east of the city centre has become a commuter town, linked by a major highway.</p> <p>If implemented as planned both Thika and Githunguri will have high quality WatSan services that will improve the lives of their residents. Moreover, they should be attractive as places where for businesses can set up and expand.</p> <p>JC Rating –  Provisional satisfactory If implemented as planned, both Thika and Githunguri will have high quality WatSan services (access to safe potable water and sewage systems) that will improve the lives of their residents. A particular challenge is that both towns are growing rapidly with their populations expected to double over the next 20 years. Expansion of the WatSan networks will therefore be continuous, another challenge requiring funding, construction and project management skills.</p>
JC 6.3 Environmental, social and governance (ESG) risk management
<p>The Environmental and Social Impact Assessment⁷⁸ (ESIA) in the FS supported by DSIF, took account of Kenyan environmental policies and laws and other national regulations and strategies, in particular, Environment Impact Assessment and Audit Regulations of 2003, National Environment Policy (NEP) 2013, Environmental Management and Coordination Act (EMCA), 2015, Water Act 2016, Gender Policy 2011 and Kenya Vision 2030. It was undertaken in the context of the UN Sustainable Development Goals (SDGs) and IFC Performance Standards. It concludes that the likely impact on the biological environment is low:</p> <ul style="list-style-type: none"> • The Project areas in Thika and Githunguri are away from any sensitive environment ecosystems. The assessment identified that there will be no direct interaction of the Project activities at the time of construction with the natural sensitive ecosystems. • If the Thika project is not appropriately operated and maintained there could be significant water pollution of the Thika River. <p>The ESIA listed a number of minor mitigation measures totalling about \$30,000 are required. There will a modest amount of land acquisition for sludge treatment, the WTPs and access roads. It is recommended that the compensation by GoK to the affected people be effected before project implementation start in order to achieve Project timelines.</p> <p>On gender, the AR noted that that AWWDA has a gender policy and procedures which will be applied to the Thika and Githunguri sub-projects. The PD stated that there will be alignment with the National Gender and Equality Commission (NGEC) Act 2011.</p> <p>In accordance with Kenya's National Gender and Equality Commission Act 2011, AWWDA has structures in place to ensure that contractors offer equal opportunities for men and women in hiring workers and project managers. The Environmental and Social Management plan or the project focuses on getting more women involved in the project.</p> <p>JC Rating -  Satisfactory The ESIA was thorough and took account of national laws and regulations as well IFC performance standards. It concluded that the likely impact on the biological environment is low</p>
JC 6.4 Contribution to climate change mitigation, green and inclusive development
<p>The project design includes a series of “green” elements, particularly related to energy consumption:</p> <ul style="list-style-type: none"> • The project will rely principally on gravity flows of surface water, reducing the need for pumping. • More energy efficient pumps will be introduced, reducing energy consumption.

⁷⁸ Athi Water Services Board – Thika Githunguri Water and Sanitation Improvement Project: Feasibility Studies, Conceptual Design and Preparation of Design-Build Tender Documentation- Environmental and Social Impact Assessment (ESIA) Study - Thika Sanitation Improvement Project NIRAS/Losai January 2019 and 2019 Feasibility Study

<ul style="list-style-type: none"> • Biogas will be generated from the sludge from the Wastewater Treatment Plants in Thika and used for electricity consumption. • Solar power is included. • A mini-hydropower scheme in Thika will be reactivated and upgraded to generate renewable power for water treatment, pumping and wastewater treatment, thereby reducing the purchase of electricity from the grid. • Depending on an analysis of the quality of the dried sludge from the Waste water Treatment Plants, this will be offered to surrounding farms as fertilizer. <p>These green elements in the project design are good both environmentally and in reducing operating costs.</p> <p>JC Rating –  Satisfactory - Green elements relating to renewable power in the project design are good both environmentally and in reducing operating costs. A mini-hydropower scheme in Thika will be reactivated and upgraded to generate renewable power for water treatment, pumping and wastewater treatment</p>
<p>JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth</p>
<p>JC Rating -  Satisfactory The project design incorporates the generation of renewable power from mini-hydro, biogas and solar sources, as well as energy efficient pumps and equipment. This will minimise the carbon footprint of TGWSIP making it compliant with the HP.</p>
<p>EQ 6 Overall Rating –  Provisional satisfactory The overall planned development effects should be positive. If implemented as planned, both Thika and Githunguri will have high quality WatSan services (access to safe potable water and sewage systems) that will improve the lives of their residents. Environmentally the project will make a positive contribution. It is designed to comply with national and IFC environmental standards. A particular challenge is that both towns are growing rapidly with their populations expected to double over the next 20 years. Expansion of the WatSan networks will therefore be continuous, another challenge requiring funding, construction and project management skills.</p>




<p>EQ 7 Commercial /developmental balance</p>	<p>Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?</p>
<p>JC 7.1 Satisfactory development outcomes(using DAC definition of impact)</p>	<p>Project implementation is expected to begin shortly. As described in JC 6.2, there are expected to be good development outcomes in rapidly growing Thika and Githunguri both of which are growing rapidly and are being absorbed into the 10 million population Nairobi metropolitan region. The project is designed to ensure that WatSan services are capable of coping with growth over the next 30 years.</p> <p>JC Rating -  N/A as project has not yet been built. Potentially satisfactory If implemented as planned, both Thika and Githunguri will have high quality WatSan services (access to safe potable water and sewage systems) that will improve the lives of their residents.</p>
<p>JC 7.2 Strong ESG performance of DSIF projects</p>	<p>As noted in JC 6.3 the ESIA, was thorough and took account of national laws and regulations as well IFC performance standards. It concluded that the likely impact on the biological environment is low.</p> <p>JC Rating -  N/A as project has not yet been built. – Potentially satisfactory If implemented as planned, then ESG performance should be good.</p>
<p>JC 7.3 Satisfactory financial returns and portfolio performance</p>	<p>The feasibility study concluded that TGWSIP had a positive economic rate of return but a negative financial rate of return. It highlighted:</p> <ul style="list-style-type: none"> • present water tariff of 0,48 Euro/m³ plus 75% surcharge for sewerage services • to be viable under commercial conditions, the tariff should be more than double at 1,08 Euro/m³, which is considered unrealistic given the users' low incomes. <p>Even under DSIF loan conditions (0% interest, 10 years maturity and a rebate on the principal of the loan to reach a 35% conditionality), the break-even tariffs were calculated at Thika 0,79 €/m³ and for Githunguri⁷⁹ 1,66 €/m³. It is therefore evident that the Government will have to contribute to the debt service payments from the general budget.</p> <p>JC Rating -  N/A as project has not yet been built. – Potentially Satisfactory – Even with concessional DSIF financing the project is not financially viable. The Government will therefore be required to contribute to the debt service payments. The developmental benefits of the project are, however, significant.</p>
<p>EQ 7 Overall Rating –  N/A as project has not yet been built. Potentially satisfactory Even with concessional DSIF financing the project is not financially viable. The Government will therefore be required to contribute to the debt service payments. The balance has therefore been in favour of developmental outcomes that are projected to be significant if the project is implemented as planned.</p>	

⁷⁹ Much smaller facilities result in higher operating costs due to a lack of economic scale.

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>The project brings together the modernisation and expansion of two existing water companies, Thika W&S Company (THIWASC) and Githunguri W&S Company (GIWASC) are expected to continue operating the water and sewerage projects in each of the two towns with relative autonomy. They report to and are overseen by Athi Water Works Development Agency (AWWDA), one of the eight Water Development Agencies under the Ministry of Water and Sanitation. Coordination, and responsibility for implementation of the project will be with AWWDA will be responsible for the implementation of the project.</p> <p>THIWASCO serves predominately Thika town and environs. There are around 35.000 active water connections and 13.000 sewerage connections. The average charge for water is Euro 0,48. The much smaller GIWASCO has 4.700 active connections.</p> <p>The challenges will both be in the construction of the physical infrastructure (water treatment and distribution of drinking water and laying pipes to bring waste water for treatment at new facilities) and the operation and maintenance (O&M) of the much larger WatSan systems in the two companies. Successful implementation of the project and the realisation of the planned development outcomes will, most likely depend on whether the new facilities can be managed as planned. In similar infrastructure projects the construction is relatively straight forward, where they fail to achieve planned development objectives is usually do a failure to set up and run O&M systems. As part of the overall project design there will be a project implementation unit that will be established within AWWDA. Moreover, part of the DSIF subsidy is for technical assistance to cover, inter alia, training of staff in THIWASC and GIWASC. The proposed support includes twinning with Danish Water Companies. A particular challenge is that both towns are growing rapidly with their populations expected to double over the next 20 years. Expansion of the WatSan networks will therefore be continuous, another challenge requiring funding, construction and project management skills.</p> <p>JC Rating - N/A as project has not yet been built. – Potentially satisfactory - This is an expansion and modernisation of two existing water companies. A project implementation unit will be established. A particular challenge is that both towns are growing rapidly with their populations expected to double over the next 20 years. Expansion of the WatSan networks will therefore be continuous, another challenge requiring funding, construction and project management skills.</p>	
JC 8.2 Level of commercial/financial viability of infrastructure	
<p>The feasibility study concluded that TGWSIP had a positive economic rate of return but a negative financial rate of return. It highlighted:</p> <ul style="list-style-type: none"> • present water tariff of 0,48 Euro/m³ plus 75% surcharge for sewerage services • to be viable under commercial conditions, the tariff should be more than double at 1,08 Euro/m³, which is considered unrealistic given the users' low incomes. <p>Even under DSIF loan conditions (0% interest, 10 years maturity and a rebate on the principal of the loan to reach a 35% conditionality), the break-even tariffs were calculated at Thika 0,79 €/m³ and for Githunguri⁸⁰ 1,66 €/m³. It is therefore evident that the Government will have to contribute to the debt service payments from the general budget.</p> <p>One way to improve financial viability is to reduce Additionally, there is need to address <i>non-revenue water</i> which encompasses both water loss due to leakages as well as non-payment of the supplied water.</p> <p>JC Rating - N/A as project has not yet been built. Potentially Satisfactory – Tariffs are only about half or less of the level required for financial viability.</p>	
JC 8.3 Level of improvements in ESG achievement	
<p>A WatSan project such as this if implemented properly should deliver significant environmental and social benefits, resulting from the provision of safe drinking water and the treatment of sewerage that would otherwise be disposed of in informal ways. A comprehensive Environmental and Social Impact Assessment was undertaken. The project has been designed to comply with national and IFC performance standards. The ESIA concluded that the likely impact on the biological environment is low:</p> <ul style="list-style-type: none"> • The Project areas in Thika and Githunguri are away from any sensitive environment ecosystems. The assessment identified that there will be no direct interaction of the Project activities at the time of construction with the natural sensitive ecosystems. • If the Thika project is not appropriately operated and maintained there could be significant water pollution of the Thika River. <p>In addition, the project includes a series of “green” elements, particularly related to energy consumption:</p> <ul style="list-style-type: none"> • The project will rely principally on gravity flows of surface water, reducing the need for pumping. • More energy efficient pumps will be introduced, reducing energy consumption. • Biogas will be generated from the sludge from the Wastewater Treatment Plants in Thika and used for electricity consumption. • Solar power is included. 	

⁸⁰ Much smaller facilities result in higher operating costs due to a lack of economic scale.

<ul style="list-style-type: none"> • A mini-hydropower scheme in Thika will be reactivated and upgraded. • Depending on an analysis of the quality of the dried sludge from the Waste water Treatment Plants, this will be offered to surrounding farms as fertilizer. <p>JC Rating – N/A as project has not yet been built. Potentially satisfactory If properly implemented it is likely that there will be significant environmental and social benefits in Thika and Githunguri.</p>
<p>EQ 8 Overall Rating – N/A as project has not yet been built. Potentially satisfactory If implemented and operated as planned, the expansion of the Thika and Githunguri water companies should be economically, socially and environmentally sustainable, provided that Government is prepared to subsidise operating costs to make up for low tariffs.</p>

<p>EQ 10 Project risk management of DSIF</p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
<p>JC 10.1 Quality of risk management systems and policies on long-term sustainability</p>	
<p>The following key risks were set out in the AR:</p> <ul style="list-style-type: none"> • The main programmatic risk identified in the AR is related to the future operation and management of the new facilities by two water companies, particularly the one in Githunguri. For that reason the project includes capacity building as an important element, both through the contractor and as a separate Technical Assistance package, including twinning with Danish water companies. While this is not a greenfield project, the challenge for both Thika and Githunguri water companies will be how easily they can build up capacity and expertise to run the new facilities as designed. • Raw water availability during the dry season is an issue given that farmers and other users already rely on same water source (Nairobi, other towns upstream and commercial farms). To mitigate this risk, two small dams are included on the Thika and Chania rivers, respectively, which will give 25-30 days buffer for the water supply (if there is no flow at all in the rivers). In case there is a severe drought, this will give the two towns some respite to negotiate their share of this common water resource. • The risk of delays due to delays in land acquisition is considered to be minor, as most land is already secured and it seems to be possible to buy the remaining land by mutual agreement. Anyway, it is a precondition for the loan to become effective that the land acquisitions have concluded. There is a considerable risk related to the operation and management of the ablution blocks in the informal settlements in Thika, but AWWDA, who will finance this part of the project itself, does not consider this to be a major risk. • One risk is that is implicit but not assessed in detail is that as both towns are growing rapidly with their populations expected to double over the next 20 years there will need to be a continuous expansion of the WatSan networks requiring, inter alia, funding, construction and project management skills. <p>JC Rating – Provisional  Satisfactory The most significant risks (operation of the enlarged water companies and access to raw water) have been identified. Whether the proposed ways of mitigating/managing these risks are effective remains to be seen.</p>	
<p>JC 10.3 Quality of environment, social and governance (ESG) risk management</p>	
<p>A comprehensive ESIA was undertaken. The project has been designed to comply with national and IFC performance standards. The ESIA concluded that the likely impact on the biological environment is low.</p> <p>JC Rating –  Provisional satisfactory If implemented as planned, the project should deliver significant environmental and social benefits in Thika and Githunguri.</p>	
<p>EQ 10 Overall Provisional Rating –  Provisional satisfactory Risk identification and formulation of appropriate mitigation/management measures in the planning and appraisal document is satisfactory.</p>	

<p>EQ 11 Result management system</p>	<p>What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?</p>
<p>JC 11.1</p>	<p>Quality and appropriateness of RMS</p>
<p>The development logic in the July 2020 project document is summarised below.</p>	
<p>Outcome 1</p>	<p>Households, industries and other consumers in Thika and Githunguri have improved access to clean and affordable water.</p>
<p>Outcome indicator</p>	<p>Number of people in the project area having improved access to clean piped water from the new project</p>
<p>Baseline 2019</p>	<p>0 0</p>
<p>5-year Target 2029</p>	<p>223.000 people 20.000</p>

End target	2044	253.000 people	31.000
Outcome 2		Reduction in wastewater released to the environment	
Outcome indicator		Quantity of wastewater (m ³ /day) collected and treated by the new STPs	
Baseline	2019	0	0
5-year Target	2029	17.000 m ³ /day	1.000 m ³ /day
End target	2044	47.000 m ³ /day	2.900 m ³ /day
Outcome 3		Demonstration of the use of energy saving and renewable energy in water production and wastewater treatment	
Outcome indicator		Reduction of grid energy for water and wastewater treatment (MWh/year)	
Baseline	2019	0	0
5-year Target	2029	5.451 MWh p.a.	318 MWh p.a.
End target	2044	5.451 MWh p.a.	318 MWh p.a.

In as far as it goes, the logic is broadly reasonable. Baselines, however, do not reflect fact that both Thika and Githunguri water companies are in operation and serving their municipalities, albeit only partially and have old or obsolete equipment. More importantly, the intervention logic does not assess development impacts for the populations in the two towns having access to clean drinking water and sanitation, such as improved health and overall welfare.

In addition, the outcome indicators should be reformulated in terms of the proportion of the total households and other users in Thika and Githunguri having access to WatSan:

- Proportion using safely managed drinking water services
- Proportion of population using safely managed sanitation services,
- Proportion of wastewater safely treated

Also there should be an indicator for improvements in the water quality in the Thika and Chania rivers as a result of the project.

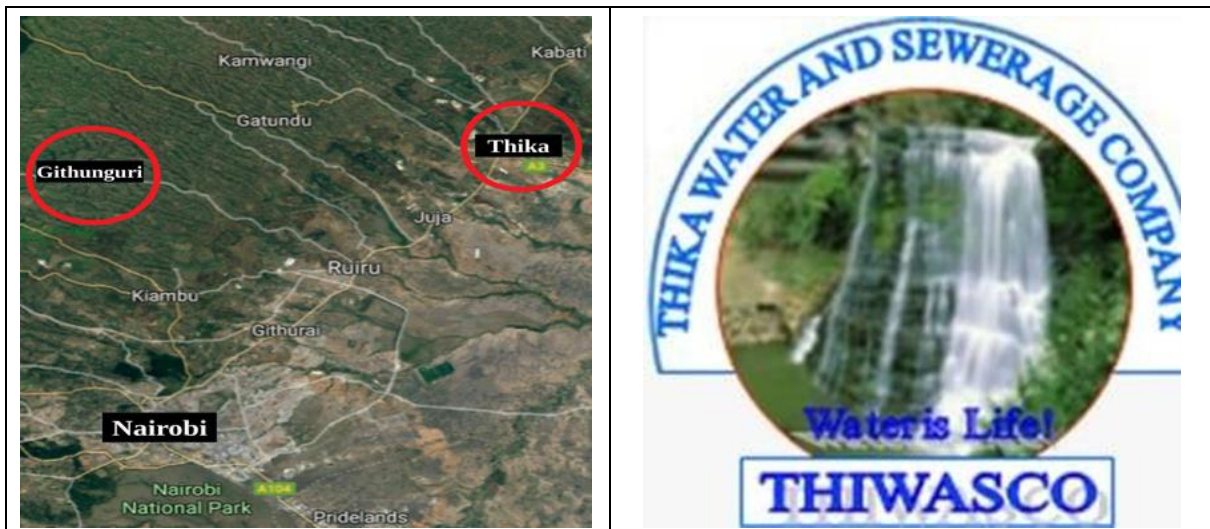
JC Rating – ● Partly Satisfactory – Greater attention should have been given to assessing the likely impacts for the populations in the two towns when they have access to clean drinking water and sanitation, such as improved health and overall welfare. Also, indicators should be in terms of the proportion of potential users and beneficiaries served.

JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

JC Rating – n/a as project yet to be implemented.

EQ 11 Overall Rating - ● Partly Satisfactory In as far as it goes, the intervention logic is broadly reasonable. The logic does not, however, assess the likely development impacts for the populations in the two towns when they have access to clean drinking water and sanitation, such as improved health and overall welfare. Also, indicators should be in terms of the proportion of potential users and beneficiaries served.

Images





Case study: Mozambique

10 Mozambique: Backbone Transmission Network II

Overview

Key issues, highlights and lessons learnt
<p>The project was successfully completed with a total delay of 10 months reported as being attributable to supplier delivery delays and rain delays. Otherwise, the project came in within contract quantities, capacity and functionality. No contractual formal claims were raised during the project implementation period.</p> <p>The project is relevant for MFA, recipient country governments, Danish partners and local stakeholders. Although there is little or no direct reference to compliance/coherence with MFA/DSIF policies as such it is considered that the project is compliant with the national poverty reduction strategy and with Danida's overall and cross-cutting objectives and is compliant with Danida telecoms policy in terms of: contribution to poverty reduction, environment, democracy and relevance for Danish Mixed Credit. The project was considered to be gender neutral and was characterised as a continuation of 'old' telecoms sector programmes (but under the 1995-1999 Strategy for Danish Bilateral Cooperation 'Telecoms' was identified as a sector to be explicitly phased out (for grant supported projects). The then extant national development policies and sector strategies were taken into account i.e. Republic of Mozambique's Poverty Reduction Strategy Paper (PARPA 2 – 2006-2009). PPF was not used for detailed design as the construction contract was essentially 'Design and build' Other development partners operations were noted but there is no reference in project documentation scrutinised to complementarity of this project to such activities by development partners as such although there is in fact a high degree of complementarity with other sector development partners operations and strategies. There is only limited reference to development impacts, mainly in connection with economic analysis in project documentation scrutinised but, in fact, there is good compliance with DSIF selection criteria⁸¹.</p> <p>Given that the project has been assessed as financially non-viable DSIF support can be considered to represent financial additionality and the project certainly would not have gone ahead without some form of concessional finance and there was no mobilisation of commercial or other development bank financing. Given that the contract includes detailed project preparation, design and training (and ensures compliance with national environmental regulations, albeit that such impacts are considered to be negligible and coverage of cross-cutting issues including gender issues, HIV/AIDS (contractor's work force and neighbouring habitations) and compliance with work rights, this support can also be considered to offer non-financial additionality. There was clear recognition of DSIF additionality expressed during the field phase.</p> <p>The Verification Report confirmed specified project outputs were achieved (i.e. commissioned and operational backbone system and team of engineers and technicians capable to operate and maintain the system).</p> <p>No comparison between ex-ante and ex-post outcomes have been scrutinised by the evaluation. There is no doubt that telecommunications projects can have a major positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government. However, although limited access to telecommunications services in the Central and Northern Provinces was identified as a main barrier for social and economic development in these provinces, there were no studies from the project areas to quantify these benefits.</p> <p>The only specified outcome indicators related to use of the project infrastructure but no reporting by TMCEL has actually taken place (although the field visit noted that the 'capacity of the network is good, stable, robust and resilient' going on to note 'the volume of data being transmitted now was not foreseen, hence the existing capacity cannot respond to the current demand.</p> <p>Financial returns and performance give cause for concern. Socio-economic benefits for the project areas were calculated although a number of derived benefits such as increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis. The project was thus found to be commercially non-viable but economically viable. It was expected that the project would be able to cover operation and maintenance costs and to pay back the loan from the revenue generated by usage of the project infrastructure. However, during the field phase it was reported that whilst the fibre optic network is being used extensively, a constraint is that the major current user of the TMCEL telecoms system is GoM institutions which are failing to pay for TMCEL services, resulting in debts and in turn TMCEL also owes substantial amounts to other companies. There is thus a very real threat to longer term viability.</p> <p>In essence the current situation can be summarised as a well-performing network unable to meet (under-estimated) demand and producing unquantified (and unreported) development results whilst sustainability and viability are under threat from non-payment by government.</p> <p>The logical framework makes no reference to risks although an assessment of risks and assumptions was made together with risk mitigation measures. However, identified risks and assumptions refer predominantly to project implementation with little reference to subsequent O&M of the project infrastructure. The absence of institutional and political economy analysis as well as policy dialogue during project identification and preparation left vital risks unassessed.</p>

⁸¹ However, this project (and BTN3) was reportedly not conceived in the framework of the Danida country program and without input* of embassy staff (or development specialist staff at MFA) during project preparation. Earlier cooperation with Mozambique's telecom company (TdM) in this sector was limited to a small pay phone project more than a decade earlier – before major sector policy shifts and reforms

M&E and reporting frameworks consistently provide accurate and timely information for implementation management of progress of the project but not of the development objectives and results/outcomes/impacts of the DSIF investment and there is no reference to 'Lessons learned'.




Summary					
Project name	Backbone Transmission Network Phase II				
Type of project	Telecoms				
Project No.	104.O.30.Mozambique				
Description	Expansion of Switching and Transmission network infrastructure including backbone and regional network capacities. This phase involved construction of routes <ul style="list-style-type: none"> • Chimoio – Tete – Caia • Cuamba – Lichinga • Nampula - Pemba 				
Sector	Telecom				
Country	Mozambique				
Sponsor	Ministry of Finance Mozambique				
Other stakeholders	Telecomunicações de Mozambique SARL (TDM)				
Approval/Binding Commitment	18/10/2006	Loan / Investment Agreement Date		08/12/2006	
Danish Bank	Nordea Bank Danmark A/S				
Loan Duration + Grace Period	10 years 0 Grace Period				
Project Amount and funding plan	€14.961.378				
Danish Exporter	Alcatel Danmark A/S	€11.493.877,66			
MFA guarantee	Date		Amount	Duration	10 years
Implementation status	Completed Implementation Period: March 2007 – July 2008 (Original plan). March 2007 – May 2009 (Actual). Verification Period of Operation: May 2009 – May 2011.				
Feasibility study details	The Pre-appraisal Report (dated 29 September 2006) was based upon a mission that visited Mozambique during the period 18 September 2006 through 23 September 2006. The TOR for this task specified that the report should include, 'in addition to the description of the project idea, its immediate objectives, project beneficiaries, socio-economic context and the sector, the AM will elaborate comprehensively on issues related to the planning background, i.a. feasibility analyses, development plans, linkages to PRSP and MDG etc'. This report is taken to be a proxy for Feasibility Study				
Subsidy – rationale and key features	PROJEKTBEVILLING 18/10/2006				
	Financial data		DKK/million	€/million	
	Amount financed		111,61		
	Loan Amount		86,10		
	Maturity		10 years		
	Grace		0		
	Total Subsidy Element				
	Total grant Cost (DKK/USD - €7,46)				
	Total		67,12	8,99	
	Interest Rate Subsidy (CIRR + 0,2 = 4,97)		21,12	2,83	
	EKF Premium		12,51	1,68	
	Bank Margin		0,83	0,11	
	Extra Grant Amount		25,38	3,40	
	Appropriation for Technical Assistance		1,00	0,13	
	Test Run Verification, etc.		0,18	0,02	

Summary		
Budget Margin 10%	6,10	0,82
Total Budget	111,61	
Total Project Investment	111,61	
Danish Contract: DKK		
Financing Bound		
<p>The Final Approval of Mixed Credit support to Loan Agreement with Nordea Bank/Ministry of Finance Mozambique has the following conditions:</p> <p>The export transaction:</p>		
Exporter:	Alcatel Danmark A/S	
Buyer:	Telecomunicações de Moçambique SARL	
Project Title:	Backbone Transmission Network, Phase 2	
Contract Date:	15/08/2006 and Amendment N° 1, 09/11/2006	
Contract amount and Currency:	EUR 14.961.377,66	
Terms of Payment:	20% Pre-payment against an advance payment guarantee and a performance guarantee covering an amount equal to 10% of the total contract amount and valid until the lapse of the defect liability period. 70% In proportion to deliveries 10% At final taking over against verified acceptance certificate	
Financing:		
Lender:	Nordea Bank Danmark A/S	
Borrower:	Ministry of Finance, Mozambique	
Guarantor:	Eksport Kredit Fonden (EKF)	
Guarantee Coverage:	95%	
Date of Loan Agreement:	17/11/2006	
Financed Amount:	100% of contract amount, in total EUR 14.961.377,66	
Loan Currency:	EUR	
Maximum Loan Amount:	EUR 11.493.877,66	
First and last disbursement dates under the loan:	15/12/2006 / 30/04/2008	
Starting point of the credit:	30 April 2008	
Repayment:	10 years	
Underlying interest (CIRR + 0,2%)	4,95% p.a.	
Borrowers interest rate:	0,00% p.a.	
Interest Subsidy Rate:	4,95% p.a.	
Bank Margin:	0,2% p.a. to be paid by Danida	
EKF Premium:	14,48% flat of maximum loan amount,	
Upfront Subsidy:	23,18% flat of financed amount,	
Interest subsidy amount:	EUR 2,718 million (approx.)	
Bank margin:	EUR 0,107 million (approx.)	
EKF premium:	EUR 1,665 million (approx.)	
Upfront subsidy:	EUR 3,4675 million	
Danida support total:	EUR 7,9575 million	
Agreed verifications:	- verification at final taking over - verification at the end of the defect liability period	
Verification party:	Danida appointed consultant	


Summary	
Country Context	<p>The limited access to telecommunications services in the Central and Northern Provinces of Mozambique was recognised by GoM as a barrier to social and economic development in these provinces - the existing telecommunications infrastructure is most developed around the capital in the southern part of the country.</p> <p>Telecommunications in the Central and Northern provinces was provided by satellite, microwave links and spur links characterised by high costs and limited capacity. The telephone subscriber density was less than 1% of the population and an unmet market demand for general bandwidth and basic broadband services had been identified.</p> <p>This project, which represented the third phase of the “Overview” plan, was conceived as a backbone transmission network in the Central and Northern part, planned to be ready for use in 2007/2008, was seen as a major element to improve the situation characterized by limited capacity and limited area of distribution. The network provided included the links:</p> <ul style="list-style-type: none"> • Chimoio-Tete-Caia; • Cuamba-Lichinga; and • Nampula-Pemba. <p>thus providing all the provincial capitals (Nampula, Pemba, Tete and Lichinga) with direct backbone network access.</p>

10.1 Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>Only a Pre-Appraisal Report (Draft) 29/09/2006 has been scrutinised by the evaluation which has little or no direct reference to compliance/coherence with MFA/DSIF policies, as such but it is considered that the project is compliant with the national poverty reduction strategy and with Danida’s overall and cross-cutting objectives and is compliant with Danida telecoms policy i.e.,</p> <p>Poverty (target groups, employment and geography)</p> <p>The direct beneficiary was TDM and the project supports TDM viability in a situation where the main previous revenue source from fixed line voice transmission was reducing whilst the telecommunication market had been fully liberalised. Indirect beneficiaries we expected to be private households and business entities, including other telecommunications operators, in the project areas, which would get access to both improved and new services. Apart from TDM, beneficiaries of the Phase 2 project was expected to be the populations getting access to the backbone network in Cabo Delgado, Niassa, Tete and Nampula which were among the poorest provinces in the. Indirectly the whole population of Mozambique would potentially benefit from the project, which made the backbone system more reliable and robust. The direct employment was minor, but the indirect employment and income generation was assumed to be significant.</p> <p>Environment</p> <p>It was not expected that the project would have any noticeable negative effect on the environment (except during construction) as most lines ran along existing road verges, rail line or along power line corridors</p> <p>Democracy</p> <p>Improved access to contemporary telecommunication services, particularly internet at affordable prices was considered to be supportive of democratisation. E-government as expected to bring all levels of government and all public institutions more effectively into the yearly planning and budget process and support the on-going decentralisation of government.</p> <p>Relevance for Danish Mixed Credit</p> <p>The project was in compliance with the Government’s poverty reduction strategy and it is ranked very high on the Government’s list of priorities. It satisfied Danida’s overall and cross-cutting objectives and was in compliance with Danida’s policy for telecommunication,</p> <p>The project complemented Danida’s education and health sector programmes in Mozambique and contributed to employment, income generation, improved living conditions and viable economic growth.</p> <p>Relevant expertise for project implementation was available in Denmark, a contract was been signed with Alcatel Danmark A/S.</p> <p>The project was considered to be commercially viable and organisationally, technically and financially sustainable.</p> <p>The relevant country strategy for Mozambique was the Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011) which had focal sectors:</p> <ul style="list-style-type: none"> • Agriculture • Environment 	

<ul style="list-style-type: none"> Health (GBS M/financial support) <p>The project was characterised as a continuation of 'old' telecoms sector programmes but under the 1995-1999 Strategy for Danish Bilateral Cooperation 'Telecoms' was identified as a sector to be explicitly phased out (for grant supported projects)</p> <p>JC Rating – Satisfactory </p>
<p>JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account</p> <p>Only Pre-Appraisal Report (Draft) 29/09/2006 has been scrutinised by the evaluation.</p> <p>The then extant national development policies and sector strategies were taken into account at (pre) Appraisal Stage i.e. Republic of Mozambique's Poverty Reduction Strategy Paper (PARPA 2 – 2006-2009 (extended to 2010 which identified priority sectors as Governance, Human capital and Economic development)).</p> <p>GoM's Information and Communication Technology (ICT) policy in 2002 defined TDM's role as backbone transmission capacity provider to other access network providers. The ICT policy implementation strategy was aimed at making ICT a decisive measure to achieve the objectives of the Government's Action Programme for the Reduction of Absolute Poverty (PARPA). The proposed programme was expected to play a significant role towards changing TDM from a traditional telecommunications service provider to a largely wholesaler of bulk transmission capacity. In 1999 a reform of the telecommunications sector started with establishment of an independent regulator, the National Communications Institute of Mozambique (INCM) and opening of the market for mobile service. In 2002 TDM was transformed from a public enterprise into a limited liability company. Government of Mozambique's Information and Communication Technology (ICT) policy defined TDM's role as backbone transmission capacity provider to other access network providers.</p> <p>JC Rating - Satisfactory </p>
<p>JC 1.3 Added value of Project Preparation Facility (PPF)</p> <p>PPF was not used for detailed design as the construction contract was essentially 'Design and build' and included:</p> <p>Site survey, updating of design, supply, delivery, installation and commissioning of the Civil Works, Optical Fibre, ADM, Shelter and Power system. On the section Caia-Tete the fibre optic cable is along the rail line, Caia-Moatize is along the road, Tete-Chimoio was mainly along the power line, Chimoio 31 km towards Vanduzi along the rail line, Namialo-Pemba is along the road and Cuamba-Lichinga followed the railway.</p> <p>JC Rating – N/A</p>
<p>JC 1.4 Complementarity with development partners operations and strategies</p> <p>Other development partners operations were noted but there is no reference in project documentation scrutinised to complementarity of this project to such activities by development partners as such. That being said there is in fact a high degree of complementarity with other sector development partners operations and strategies</p> <p>At the time of project preparation a number of projects had been undertaken in preceding years (and were being implemented) in the telecommunications sector with various links of the TDM National Backbone Transmission Network having been financed by different IFIs e.g.:</p> <ul style="list-style-type: none"> EU - extension of the rural telecommunications network in the Gaza and Inhambane provinces to 39 districts and towns (2003) Arab Bank for Economic Development in Africa (BADEA) - rural telecommunications network in Tete province (2006) Banco Comercial e de Investimentos (BCI) - Xai-Xai/Massinga Link (2001) Development Bank of Southern Africa (DBSA)/KfW/TDM – Maputo/Beira Link (2002) Development Bank of Southern Africa (DBSA) – Nampula/Nacala & Chokwe/Massangir Links (2006) Banco Comercial e de Investimentos (BCI)/TDM – Maputo/ Xai-Xa/Chokwe Links (2006) Development Bank of Southern Africa (DBSA)/Banco Internacional de Mozambique (BIM) – Beira/Caia/Quelimane Links (2007) TDM – Beira/Chimoio/Manica Links (2003) & Maputo/Ressano Garcia Link (2006) Export Import Bank of China - connect 42 district towns with the fibre optical backbone by micro wave (2006) <p>The DSIF investment was complementary with these projects in completion of 'missing links' in the network</p> <p>JC Rating – Satisfactory </p>
<p>JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts</p> <p>There is only limited reference to development impacts, mainly in connection with economic analysis in project documentation scrutinised but, in fact, there is good compliance with DSIF selection criteria - the following core principles form the foundation of Danida Sustainable Infrastructure Finance project identification and selection and compliance with these principles is shown <i>thus</i>:</p> <ul style="list-style-type: none"> Focus countries: GNI per capita below USD 3.895 (2019) and countries where Denmark has a representation – <i>condition fulfilled at time of project preparation</i>

- Involvement of Danish companies that are internationally competitive - Projects in sectors with Danish core competencies - where Danish companies. This means that goods should be competitive based on not only the purchase price, but on total cost, including operating cost (e.g. cost effectiveness of energy and water efficiency). –*condition fulfilled; Danish companies have sector competence, in this case Alcatel Denmark A/S*
- Acceptable guarantor/ministry of finance or other credit institution: - *condition fulfilled (MOF as 'Borrower'*
- Sustainable Development Goals should be reflected:.
- Sustainability criteria: Projects will be assessed on sustainability criteria in the following areas, including IFC performance standards and UN guiding principles for business and human rights:
 - Environment & climate – Projects should address adverse effects on environment or climate, supporting a transition to low carbon economy – *minimal residual environmental impacts; temporary impacts during construction readily manageable.*
 - Economic –*The results (EIRR 11,9%) show that the project is economically viable (although it was noted that ' There is large uncertainty related to the specific figures')*
 - Institutional and organizational capacity - *A review and verification undertaken of all the essential elements of the project, based on problem analysis (LFA); the current situation; problems to be addressed (legislative, institutional, human resource, gender, technical, environmental, financial, etc.), including an assessment of possible alternative technical and/or technological options, measured against technical, cost and operational feasibility and sustainability, considering as well the environment in which to operate.*
 - Social risks and impacts – *see above*
- Country development strategy and sector plan in place: Projects should be based on local demand and needs. This is achieved by requiring that projects are reflected in national development strategy and sector plans – *compliant with Republic of Mozambique's Poverty Reduction Strategy Paper (PARPA 2 – 2006-2009 (extended to 2010 which identified priority sectors as Governance, Human capital and Economic development*
- Project size: minimum size of DKK 100 million. Upper limit depends on budget available – *project budget DKK111,61 million.*
- Growth and employment in developing country and Denmark: Projects should contribute to growth and employment in recipient country and/or in Denmark – *expected benefits include increased employment.*
- Complementarity and synergy: Projects considered complementary to other Danish activities - development activities as well as trade and investment related activities – will be favoured – *complementarity in general terms only (not compliant with current Danish focal sectors – see JC 1-1 above.*
- Also, scaling up or new phases of previous projects would be considered positive – *continuation of previous Danish sector support.*

JC Rating – Satisfactory 

EQ 1 Overall Rating – Satisfactory

The project is relevant for MFA, recipient country governments, Danish partners and local stakeholders. Although there is little or no direct reference to compliance/coherence with MFA/DSIF policies as such it is considered that the project is compliant with the national poverty reduction strategy and with Danida's overall and cross-cutting objectives and is compliant with Danida telecoms policy in terms of: contribution to poverty reduction (target groups, employment and geography), environment (it was not expected that the project would have any noticeable negative effect on the environment except during construction), democracy (improved access to contemporary telecommunication services, particularly internet at affordable prices was considered to be supportive of democratisation) and relevance for Danish Mixed Credit (the project was in compliance with the Government's poverty reduction strategy, was ranked high on the GoM list of priorities, satisfied Danida's overall and cross-cutting objectives and was in compliance with Danida's policy for telecommunication whilst relevant expertise for project implementation was available in Denmark and the project was considered to be commercially viable and organisationally, technically and financially sustainable. The project was considered to be gender neutral and was characterised as a continuation of 'old' telecoms sector programmes (but under the 1995-1999 Strategy for Danish Bilateral Cooperation 'Telecoms' was identified as a sector to be explicitly phased out (for grant supported projects)

The then extant national development policies and sector strategies were taken into account at (pre) Appraisal Stage i.e. Republic of Mozambique's Poverty Reduction Strategy Paper (PARPA 2 – 2006-2009 (extended to 2010 which identified priority sectors as Governance, Human capital and Economic development)).

GoM's Information and Communication Technology (ICT) policy in 2002 defined TDM's role as backbone transmission capacity provider to other access network providers.

PPF was not used for detailed design as the construction contract was essentially 'Design and build'

Other development partners operations were noted but there is no reference in project documentation scrutinised to complementarity of this project to such activities by development partners as such although there is in fact a high degree of complementarity with other sector development partners operations and strategies.

The DSIF investment was complementary with these projects in completion of 'missing links' in the network

There is only limited reference to development impacts, mainly in connection with economic analysis in project documentation scrutinised but, in fact, there is good compliance with DSIF selection criteria.

EQ 2 -Coherence

To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?

JC 2.1 Systematic research for coherence with MFA development policies and strategy


Project documentation scrutinised by the evaluation has little or no direct reference to compliance/coherence with MFA and DSIF policies but the evaluation finds that the project is compliant with MFA and DSIF overall objectives and is compliant with Danida telecoms policy as regards contribution to poverty reduction, few negative environmental impacts (mainly during construction), contribution to democratisation and E-government. The project was considered to be gender neutral.

As regards relevance for DSIF, the project was compliant with GoM poverty reduction strategies and support to telecoms was ranked high on the GoM list of priorities. The project was considered to be commercially viable and organisationally, technically and financially sustainable and relevant expertise for project implementation was available in Denmark - a contract was signed with Alcatel Danmark A/S.

The relevant Danish country strategy for Mozambique was the *Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011)* which had focal sectors:


- Agriculture
- Environment
- Health (GBS M/financial support)

The project was characterised as a continuation of 'old' telecoms sector programmes but under the 1995-1999 Strategy for Danish Bilateral Cooperation 'Telecoms' was identified as a sector to be explicitly phased out (for grant supported projects). Also, the project was identified as complementary to Danida's education and health sector programmes in Mozambique (as well as contributing to employment, income generation, improved living conditions and viable economic growth). This assertion is accepted although the education sector was identified as a sector explicitly to be phased out under the 2007 – 2011 Danish strategy.

JC Rating – Satisfactory 


JC 2.2 Synergies /complementarity with other Danish development initiatives

Project documentation has little or no direct reference to compliance/coherence with MFA and DSIF policies but the project is compliant with MFA and DSIF overall objectives and is compliant with Danida telecoms policy. The project demonstrated clear synergies/complementarity with other Danish development initiatives (as well as compliance with GoM poverty reduction) as to be expected given that the project was characterised as a continuation of 'old' Danish support to telecoms sector programmes (and that a further Phase 3 project in support of the Backbone Transmission Network was being mooted at the time of project preparation – this phase 3 actually went ahead). However, although there is a high degree of complementarity with other sector development partners operations and strategies (the DSIF investment was complementary with these projects in completion of 'missing links' in the network) there is less such direct synergy to then current Danish support strategy for Mozambique. Although the project was identified as complementary to Danida's education and health sector programmes in Mozambique (as well as contributing to employment, income generation, improved living conditions and viable economic growth), education sector was identified as a sector explicitly to be phased out under the 2007 – 2011 Danish strategy whilst under the 1995-1999 Strategy for Danish Bilateral Cooperation 'Telecoms' was identified as a sector to be explicitly phased out (for grant supported projects).

JC Rating – Satisfactory 

JC 2.3 Danish business links with beneficiary countries

The discussion on striking a balance between incentives for the involvement of Danish business and the cost-efficiency of the goods and services provided goes back to at least the 90s but overall increased involvement of Danish business expertise in the development of Mozambique was envisaged. Some Danish companies do have specialised and appropriate experience and capabilities in telecoms (notably Siemens Denmark and Alcatel Denmark A/S) and Danish suppliers have been involved in other phases of the Mozambique Backbone Project. The first phase of the national network comprised the sea cable from Maputo to Beira with a digital microwave link from Beira to Manica. This first phase was implemented in 2003. The second phase comprised three steps with the terrestrial connection from Beira to Quelimane as the first step, the connection from Quelimane to Mocuba and the triangle Mocuba – Cuamba – Nampula – Mocuba as the second step, and a number of rural networks in the Central and Northern provinces as the third step. The second phase was presented to Danida in early 2005 with a request for financing under the Danish Mixed Credits facility, based on the winning bid of a Danish supplier, Alcatel. The contract value amounted to approximately €12,7 million and a Danish Mixed Credit in this amount was approved in 2005. This current phase (which would be the second phase of DSIF financing) continues Danish involvement.

JC Rating - Satisfactory 

EQ 2 Overall Rating – Satisfactory 




The project is compliant with MFA and DSIF overall objectives and is compliant with Danida telecoms policy as regards contribution to poverty reduction, few negative environmental impacts (mainly during construction), contribution to democratisation and E-government. As regards relevance for DSIF, the project was compliant with GoM poverty reduction strategies and support to telecoms was ranked high on the GoM list of priorities. The project was considered to be commercially viable and organisationally, technically and financially sustainable and relevant expertise for project implementation was available in Denmark. The project was characterised as a



continuation of 'old' telecoms sector programmes but under the 1995-1999 Strategy for Danish Bilateral Cooperation 'Telecoms' was identified as a sector to be explicitly phased out (for grant supported projects). Also, the project was identified as complementary to Danida's education and health sector programmes in Mozambique (although the education sector was identified as a sector explicitly to be phased out under the 2007 – 2011 Danish strategy).

There is a high degree of complementarity with other sector development partners operations and strategies (the DSIF investment was complementary with these projects in completion of 'missing links' in the network)


Some Danish companies do have specialised and appropriate experience and capabilities in telecoms (notably Siemens Denmark and Alcatel Denmark A/S) and Danish suppliers have been involved in other phases of the Mozambique Backbone Project.

The second stage in this national network comprised three steps with the terrestrial connection from Beira to Quelimane as the first step, the connection from Quelimane to Mocuba and the triangle Mocuba – Cuamba – Nampula – Mocuba as the second step, and a number of rural networks in the Central and Northern provinces as the third step. The second phase was presented to Danida in early 2005 with a request for financing under the Danish Mixed Credits facility, based on the winning bid of a Danish supplier, Alcatel. This current phase (which would be the second phase of DSIF financing) continues Danish involvement.

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
There is clear financial additionality in DSIF financing given that the project was financially/commercially non-viable (i.e. the project is not bankable and thus only concessional funding to GoM was the only option for what was considered to be an economically viable project – see also EQ8 below). The project was this appropriate for DSIF support. However, this estimation of economic viability was based upon expected revenues from use of the fibre optic network that would be able to cover operation and maintenance costs and to pay back the loan from such revenues. However, during the field phase it was reported that whilst the fibre optic network is being used extensively, a constraint is that the major current user of the TMCEL telecoms system is GoM institutions which are failing to pay TMCEL, resulting in huge debts and in turn TMCEL also owes substantial amounts to other companies. There is thus a very real threat to longer term economic viability (although it is not reported whether there is a resultant threat to operations and maintenance of the network)	
JC Rating – Satisfactory 	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
There is evidence of DSIF non-financial additionality including: compliance with national environmental regulations (although it was noted that 'Environmental impacts during construction and operation of the project are considered to be insignificant and TDM has experience from earlier projects in achieving the environmental license required'). coverage of cross-cutting issues will essentially address environmental, gender, HIV/AIDS, fundamental work rights (in compliance with the ILO Declaration on Fundamental Principles and Rights at Work) project detailed design (covered by the construction contract package – design and build contract) training was also included in the contract package (i.e. as part of the project delivery, in order to ensure a satisfactory commissioning of the system and the future operation and maintenance). The field visit in Q2I 2021 found that DSIF additionality as perceived by TMCEL was: DSIF funding was the most successful national project for TDM (TMCEL), considering the size, the quality, good relationship with the partner / all the interested parties and the impact of the project. The project was implemented 10 years ago, and until now the network is still operational and functioning well (to its capacity). Danida was open and cooperative, they did not reject anything from what was projected - they accepted everything, there was no limitation of funds and the whole process was so quick. The projects (BTN II and BTN III) run very well and there were no issues during and even after the implementation of the project.	
JC Rating - Satisfactory 	
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	
No other sources of financing were mobilised. JC Rating – N/A	
EQ 5 Overall Rating – Satisfactory  Given that the project has been assessed as financially non-viable DSIF support can be considered to represent financial additionality and the project certainly would not have gone ahead without some form of concessional finance and there was no mobilisation of commercial or other development bank financing.. Given that the contract includes detailed project preparation, design and training (and ensures compliance with national environmental regulations, albeit that such impacts are considered to be negligible and coverage of cross-cutting issues including gender issues, HIV/AIDS (contractor's work force and neighbouring habitations) and compliance with work rights, this support can also be considered to offer non-financial additionality. There was clear recognition of DSIF additionality expressed during the field phase.	

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
<p>The Verification Report (Netplan A/S) confirmed:</p> <ul style="list-style-type: none"> • Effective date of contract was 6 March 2007, the project implementation period was 16.5 months, the ground breaking ceremony took place in October 2007 and was the formal start of installation work. • Provisional Acceptance Test / Commissioning was finished in May 2009 and the formal takeover date was 15 May 2009 resulting in an overall formal project delay of 10 months. Since September 2008 commercial telecom traffic has been introduced stepwise starting with the highest prioritised route Chimoio – Tete. <p>The Verification conclusions were:</p> <ul style="list-style-type: none"> • The project was completed according to the contract concerning quantities, capacity, quality and functionality. • The immediate objective to improve access to telecommunications services in the Central and Northern provinces has been achieved. • Specified project outputs achieved i.e. commissioned and operational backbone system and team of engineers and technicians capable to operate and maintain the system. • Specified project output indicators achieved i.e. installed capacity (Mbps), person-days of training completed (days). • Specified outcome indicators to be verified by TMCEL over a 5 year period i.e. number of pending items from defects notification, failures in the system, provisional Acceptance Test. <p>Final Acceptance Test took place 24 months after Provisional Acceptance Test.</p> <p>JC Rating - Satisfactory </p>	
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
<p>Project purpose and outcomes were identified as follows (while noting that no project specific studies were carried out).</p> <p>Purpose: The aim of the project was to ensure access to telecommunications for the poorer part of Mozambique. The project includes an increase in telecommunications capacity through the laying of optical fibre cables as backbone networks in the central and northern provinces of the country as well as the establishment of additional telephone exchanges along this network, in order to ensure new communication opportunities for rural areas. The overall development objective of the project was to improve access to telecommunications in order to create a basis for economic growth and thereby a reduction in poverty as well as an improvement in the standard of living, mainly in the central and northern provinces.</p> <p>Telecommunications projects in general can have a major positive impact on socio-economic development by improving access to information and knowledge and assist the expansion of business production and trade. A number of derived benefits like increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis but are recognised as potential benefits. However, the specified outcome indicators refer only to technical operation of the project infrastructure (and these indicators appear not to have been reported upon post completion)</p> <p>The field visit reports that the project BTN II (and BTN III) run very well and there were no issues during and even after the implementation of the project. The major users of the fibre optic are MoRENet (Network for Universities / Institutes of Higher Education, Technical Colleges / Schools, Research Institutions) Gov.Net (Network for all government institutions – Ministries, public institutions, provincial directorates, Parque de Ciências e Tecnologias de Maluane – Maluane Science and Technology Park, etc). MoRENet which interconnects 180 institutions (additional 103 are in a process of being connected) and Gov.Net interconnecting 700 institutions are the biggest communication networks for the government of Mozambique and use the fibre optic circuits – depend on fibre optic.</p> <p>According to the major users the capacity of the fibre optic is good, and the network is stable, robust and resilient. However, the coverage is limited, and the quality of the network is only good where there is good coverage. The transmission electronics equipment placed at the terminals in the capital cities was designed / planned for voice and now it is being used for videos, etc. and it has no capacity to respond to the demand on data. During the design, the volume of data being transmitted now was not foreseen, hence the existing capacity cannot respond to the current demand on data. For example, in area such as Vilanculo and Chibuto where there are state owned Universities there is no fibre optic and the network is weak. In these areas MoRENet needs about 100MB/s in these areas for online meetings, conference calls, online lessons, etc. and it was supposed to get 100MB/s from two suppliers (one being the main and the other one being backup), but MoRENet can only get 10MB/s from TMCEL, making MoRENet use Vodacom and Movitel networks as the main sources.</p> <p>JC Rating – Partly Satisfactory </p>	
JC 6.3 Environmental, social and governance (ESG) risk management	
<p>An EIA was undertaken in compliance with national legislation (i.e. Decree N° 45 of 2004) . In general telecommunications projects are “soft projects” from an environmental point of view and it was found that environmental impacts will accrue mainly during construction (but will not be serious) and operational impacts of the project will be insignificant.</p>	

Environmental issues were also covered in reporting on implementation progress (e.g. 'Monitoring the Implementation of Rural Infrastructure Project NTH21 Backbone Transmission in Mozambique, Danida Progress Report 01/08/2008). This reporting detailed compliance with procedures for pre-assessment study (2006), permission/authorisation and certification (end of 2008)

JC Rating – Satisfactory 

JC 6.4 Contribution to climate change mitigation, green and inclusive development


No reference to climate change or to ex-ante/ex-post comparisons.

JC Rating –N/A

JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

As the project predated the Helsinki Principles' by many years, there was no explicit consideration of low carbon and climate resilience growth. However, this project has been assessed of having negligible direct long term environmental impact (as the fibre optic cables are buried) and limited short term environmental impacts were adequately mitigated during construction.

JC Rating – N/A

EQ 6 Overall Rating – Partly Satisfactory 

The Verification Report (Netplan A/S) confirmed specified project outputs were achieved (i.e. commissioned and operational backbone system and team of engineers and technicians capable to operate and maintain the system).

Project purpose and outcomes were identified (while noting that no project specific studies were carried out). i.e. the overall development objective of the project was to improve access to telecommunications in order to create a basis for economic growth and thereby a reduction in poverty as well as an improvement in the standard of living, mainly in the central and northern provinces. Telecommunications projects can have a major positive impact on socio-economic development by improving access to information and knowledge and assist the expansion of business production and trade (although a number of benefits such as increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis but are recognised as potential benefits). However, the specified outcome indicators refer only to technical operation of the project infrastructure and these indicators appear not to have been reported upon post completion). However field visit reports note that the project BTN II runs very well and there were no issues during and even after the implementation of the project. According to the major users the capacity of the fibre optic is good, and the network is stable, robust and resilient. However, the coverage is limited, and the quality of the network is only good where there is good coverage.

An EIA was undertaken in compliance with national legislation - telecommunications projects are "soft projects" from an environmental point of view and it was found that environmental impacts would accrue mainly during construction (but not be serious) and operational impacts of the project would be insignificant. Environmental issues were also covered in reporting on implementation progress. No reference to climate change or to ex-ante/ex-post comparisons or compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth (as the project predated the Helsinki Principles' by many years, there was no explicit consideration of low carbon and climate resilience growth).

EQ 7 Commercial /developmental balance

Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?

JC 7.1 Satisfactory development outcomes (using DAC definition of impact)

No comparison between ex-ante and ex-post outcomes have been scrutinised by the evaluation. There is no doubt that telecommunications projects can have a major positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government. However, although limited access to telecommunications services in the Central and Northern Provinces was identified as a main barrier for social and economic development in these provinces, there were no studies from the project areas to quantify these benefits but some studies from other developing countries were used to try to quantify some benefits although there was a recognised risk that these results may not have been applicable in the project areas in Mozambique. Socio-economic benefits for the project areas were calculated by estimating household benefits and increased business opportunities on the basis of the willingness to pay for telecommunications services by these consumer categories although a number of derived benefits such as increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis.

The only specified outcome indicators related to use of the project infrastructure (annual traffic volume in relation to expected), including number of subscriber lines and stability of lines and networks (per cent relative to expected) but no reporting by TMCEL has actually taken place (although the field visit noted that the '*capacity of the network is good, stable, robust and resilient*' going on to note '*the volume of data being transmitted now was not foreseen, hence the existing capacity cannot respond to the current demand on data. For example, in area such as Vilanculo and Chibuto where there are state owned Universities there is no fibre optic and the network is weak. In these areas MoRENet needs about 100MB/s in these areas for online meetings, conference calls, online lessons, etc. and it was supposed to get 100MB/s from two suppliers (one being the main and the other*

one being backup), but MoRENet can only get 10MB/s from TMCEL, making MoRENet use Vodacom and Movitel networks as the main sources'.

JC Rating – Partly satisfactory 

JC 7.2 Strong ESG performance of DSIF projects

No comparisons of ex-ante and ex-post ESG performance have been scrutinised by the evaluation other than coverage of environmental issues in implementation progress monitoring reports. In these reports it was noted that the Environment Impact Assessment (EIA) was processed according to national laws and regulations involving TDM and MICOA in obtaining permission/authorisation and environmental certificate. Environmental program and procedures were strictly followed and implemented. Environmental impacts during construction arose from excavation along road sides (and to a lesser extent rail lines and transmission lines) and were of a temporary nature. Longer term environmental impacts during operation were correctly described as minimal. Indirect benefits expected included a positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government given that limited access to telecommunications services in the Central and Northern Provinces had been identified as a main barrier for social and economic development in these provinces.

There is limited consideration of gender issues beyond noting that Government had a policy for active promotion of women in social and economic activities and that the role and lives of women in the community would improve as emergency and regional services would be accessible through improved telecommunications access.

JC Rating – Partly satisfactory 

JC 7.3 Satisfactory financial returns and portfolio performance

Financial returns and performance give cause for concern.

An economic analysis was carried out although the basis of this analysis was limited (no studies from the project area) and, although risks were identified in using studies from other countries, these studies were used for comparison purposes. The analysis also noted major problems in quantifying socio-economic benefits going on to observe that telecommunications projects in general can have a major positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government. Socio-economic benefits for the project areas were calculated by estimating household benefits and increased business opportunities on the basis of the willingness to pay for telecommunications services by these consumer categories. However, a number of derived benefits such as increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis. The project was thus found to be commercially non-viable) but economically viable. It was expected that the project would be able to cover operation and maintenance costs and to pay back the loan from the revenue generated by usage of the project infrastructure. However, during the field phase it was reported that whilst the fibre optic network is being used extensively, a constraint is that the major current user of the TMCEL telecoms system is institutions which are failing to pay TMCEL services, resulting in debts and in turn TMCEL also owes substantial amounts to other companies. There is thus a very real threat to longer term economic viability.

JC Rating – Unsatisfactory 


EQ 7 Overall Rating – Partly satisfactory

No comparison between ex-ante and ex-post outcomes have been scrutinised by the evaluation. There is no doubt that telecommunications projects can have a major positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government. However, although limited access to telecommunications services in the Central and Northern Provinces was identified as a main barrier for social and economic development in these provinces, there were no studies from the project areas to quantify these benefits.

The only specified outcome indicators related to use of the project infrastructure but no reporting by TMCEL has actually taken place (although the field visit noted that the 'capacity of the network is good, stable, robust and resilient' going on to note 'the volume of data being transmitted now was not foreseen, hence the existing capacity cannot respond to the current demand on data such that MoRENet can only get 10MB/s from TMCEL, making MoRENet use Vodacom and Movitel networks as the main sources'.

Financial returns and performance give cause for concern. Socio-economic benefits for the project areas were calculated although a number of derived benefits such as increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis. The project was thus found to be commercially non-viable but economically viable. It was expected that the project would be able to cover operation and maintenance costs and to pay back the loan from the revenue generated by usage of the project infrastructure. However, during the field phase it was reported that whilst the fibre optic network is being used extensively, a constraint is that the major current user of the TMCEL telecoms system is GoM institutions which are failing to pay for TMCEL services, resulting in debts and in turn TMCEL also owes substantial amounts to other companies. There is thus a very real threat to longer term viability.

In essence the current situation can be summarised as a well-performing network unable to meet (under-estimated) demand and producing unquantified (and unreported) development results whilst sustainability and viability are under threat from non-payment by government although the absence of institutional and political economy analysis as well as policy dialogue during project identification and preparation left vital risks unassessed..


EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>An economic analysis was carried out although the basis of this analysis was limited (no studies from the project area) and, although risks were identified in using studies from other countries, these studies were used for comparison purposes.</p> <p>An economic analysis was carried out which noted major problems with quantifying and valuating socio-economic benefits going on to observe that telecommunications projects in general can have a major positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government.</p> <p>There were no studies from the project areas to quantify these benefits but studies from other developing countries that have tried to quantify some benefits (e.g. Bhutan) were referenced. There was a recognised risk that these results may not have been applicable in the project area in Mozambique and the opinion of the evaluation is that there were indeed risks in assigning too much weight to such comparisons. However, socio-economic benefits for the project areas were calculated by estimating household benefits and increased business opportunities on the basis of the willingness to pay for telecommunications services by these consumer categories (e.g. monthly fees and leasing of lines).</p> <p>The value of development of IT was estimated using results from other studies. A number of derived benefits such as increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis. The analysis showed that the economic benefits would justify the project investment. There was recognised to be large uncertainty related to the specific figures, but noting the omitted potential benefits mentioned above, it seems reasonable to conclude that the project is the actual EIRR is likely to be higher (i.e. the project is economically viable on this basis).</p> <p>It was expected that the telecom project would be able to cover operation and maintenance costs and to pay back the loan from the revenue generated by the project (and with financing y DSIF there would be no interest payments related to the project). However, during the field phase it was reported that whilst the fibre optic network is being used extensively, the constraint is that the major current user of the TMCEL telecoms system is GoM (through MoRENet and Gov.Net). These government institutions are failing to pay their bills to TMCEL, resulting in huge debts and in turn TMCEL also owes substantial amounts to other companies. There is thus a very real threat to longer term economic viability (although it is not reported whether there is a resultant threat to operations and maintenance of the network)</p> <p>JC Rating – Partly Satisfactory </p>	
JC 8.2 Level of commercial/financial viability of infrastructure	
<p>A financial analysis at appraisal showed that the project would be commercially non-viable (and thus would be unlikely to go ahead unless it could be financed through the Danish Mixed Credits with a zero interest payment⁸²).</p> <p>The PROJEKTBEVILLING consideration of financial and economic viability notes that income was primarily expected to come from user fees and was expected to cover the repayment of the loan as well as operating and maintenance costs. Given the observations on large and increasing government debts to TMCEL, this assumption is currently not valid (although it is not reported whether there is a resultant threat to operations and maintenance of the network).JC Rating – Partly Satisfactory </p>	
JC 8.3 Level of improvements in ESG achievement	
<p>Environmental impacts during construction arose from excavation along road sides (and to a lesser extent rail lines and transmission lines) and were of a temporary nature. Longer term environmental impacts during operation were correctly described as insignificant.</p> <p>Indirect benefits expected included a major positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government (although such benefits were not taken into account in financial and economic analyses) given that limited access to telecommunications services in the Central and Northern Provinces was identified as a main barrier for social and economic development in these provinces.</p> <p>JC Rating – Satisfactory </p>	
<p>EQ 8 Overall Rating – Partly Satisfactory </p> <p>An economic analysis was carried out which noted major problems with quantifying and valuating socio-economic benefits going on to observe that telecommunications projects in general can have a major positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government.</p> <p>There were no studies from the project areas to quantify these benefits but studies from other developing countries that have tried to quantify some benefits were referenced although there was a recognised risk that</p>	

⁸² The original calculations assumed a maturity period of 15 years (this was reduced to 10 years at PROJEKTBEVILLING)

these results may not have been applicable in the project area in Mozambique. Socio-economic benefits for the project areas were calculated by estimating household benefits and increased business opportunities on the basis of the willingness to pay for telecommunications services by these consumer categories. A number of derived benefits such as increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis.

It was expected that the telecom project would be able to cover operation and maintenance costs and to pay back the loan from the revenue generated by the project. However, during the field phase it was reported that whilst the fibre optic network is being used extensively, a constraint is that the major current user of the TMCEL telecoms system is GoM institutions which are failing to pay TMCEL, resulting in huge debts and in turn TMCEL also owes substantial amounts to other companies. There is thus a very real threat to longer term economic viability (although it is not reported whether there is a resultant threat to operations and maintenance of the network)

Environmental impacts during construction arose from excavation along road sides (and to a lesser extent rail lines and transmission lines) and were of a temporary nature. Longer term environmental impacts during operation were correctly described as insignificant. Indirect benefits expected included a major positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government (although such benefits were not taken into account in financial and economic analyses) given that limited access to telecommunications services in the Central and Northern Provinces was identified as a main barrier for social and economic development in these provinces.

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
JC 10.1 Quality of risk management systems and policies on long-term sustainability	
<p>The logical framework (see JC 11.1 below) makes no reference to risks although an assessment of risks and assumptions was made at Appraisal Stage together with risk mitigation measures and it was concluded 'that all major risks had been mitigated through the project set-up and conditions set'.</p> <p>However, identified risks and assumptions refer predominantly to project implementation with little reference to subsequent O&M of the project infrastructure.</p> <p>The following risks related to output were identified (together with proposed mitigation measures) <i>with evaluation commentary</i>:</p> <ul style="list-style-type: none"> • The Danish turnkey supplier will not be able to deliver according to contract (agreed contract conditions secure good and manageable parameters for controlling the main contractor and ultimately the contract could be cancelled according to FIDIC rules. Compared to the previous Danida financed telecom project, this project consists of three separate segments spread out over a larger geographical area and placed in more rural environments. Consequently, the contract time span from contract effectiveness through commissioning gap was increased by 3 months compared to the previous Danida project. However, due to the seriously deteriorated condition of some roads parallel to the routing of the project segments, the pre-appraisal team believes that the time allowed for implementation of some project segments may need to be further increased). <i>The selection criteria note that Danish Contractors have the capacity and experience for this type of work in Mozambique whilst the reference to FIDIC provisions is correct, this would not in itself protect against contract failure. The higher logistical issues (compared with previous Danish sector works was correctly identified but in fact there was a 10 month delay in project delivery.</i> • TDM will not be able to manage the implementation of the project - <i>TDM had project responsibility in the implementation phase and was assessed to be a well-run organization with a professional management. To manage the project, a project group of a multidisciplinary nature was formed and a project manager appointed, responsible to TDM's technical director. As it was estimated that TDM itself has the necessary technical knowledge to implement the project, only a monitoring consultant is needed. However, there was considered to be a need for selected employees in the organization to undergo a training program as part of the project delivery, in order to ensure a satisfactory commissioning of the system and the future daily operation and maintenance and the contract included a training package to establish the necessary capacity in the project organization for the implementation, operation and maintenance of the new telecommunications system</i> • The market will not expand as expected - <i>This has turned out to be a more significant risk. Demand for landline connections has fallen, while the need for mobile and Internet services has increased significantly (at the time of project preparation the fixed network still accounted for 68% of TDM revenue). In the meantime there has been considerable competition from mobile network operators (such as Vodaphone).</i> • A framework agreement for financing cannot be achieved between the Danish and Mozambique Governments – <i>this was a precondition for DSIF financing and cannot therefore be considered as a valid risk.</i> 	
Implementation progress reporting mentioned risks as relating to contract progress [e.g. Progress Report 21/08/2008 notes risks relating to: soil conditions, getting sufficient labour for manual excavation in general and in the Tete area particularly and timely coordination with the road authorities (ANE)].	
JC Rating – Partly satisfactory 	

JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio


M&E and reporting frameworks consistently provide accurate and timely information for implementation management of progress of the project but not of the development objectives and results/outcomes/impacts of the DSIF investment and there is no reference to 'Lessons learned'.

The specified Development Objective of the project is 'To support socio-economic development by facilitating increased opportunities and increased efficiency in most social and economic activities' whilst the Immediate Objective is 'To improve access to telecommunications services in the Central and Northern Provinces' although specified outcome indicators relate only to operation of the infrastructure.

Regular progress reporting has been carried out covering major components of works activities and such reporting continued to Verification of the Works – provisional acceptance testing/commissioning finished May 2009 with financial take-over 15/05/2009 which represented a delay of 10 months.

Although it was agreed that for the first five years after commissioning, the buyer will be responsible for providing data for use on the outcome indicators on an annual basis, no such ex-post reporting appears to have been supplied.

JC Rating – Partly Satisfactory 

EQ 10 Overall Rating – Partly Satisfactory 

The logical framework makes no reference to risks although an assessment of risks and assumptions was made at Appraisal Stage together with risk mitigation measures and it was concluded at 'ProjektBEVILLING' that *'The project is not considered to be associated with significant risk elements that may prevent the project from achieving the intended effects. The connection of subscriber lines, which must be established subsequently, may prove to be slower than expected, but this element of uncertainty is not considered to pose a significant risk that could reduce the project's sustainability'*. However, identified risks and assumptions refer predominantly to project implementation with little reference to subsequent O&M of the project infrastructure.

Implementation progress reporting mentioned risks as relating to contract progress [e.g. Progress Report 21/08/2008 notes risks relating to: soil conditions, getting sufficient labour for manual excavation in general and in the Tete area particularly and timely coordination with the road authorities (ANE)].

M&E and reporting frameworks consistently provide accurate and timely information for implementation management of progress of the project but not of the development objectives and results/outcomes/impacts of the DSIF investment and there is no reference to 'Lessons learned'.

Regular progress reporting has been carried out covering major components of works activities and such reporting continued to Verification of the Works – provisional acceptance testing/commissioning finished May 2009 with financial take-over 15/05/2009 which represented a delay of 10 months.




Although it was agreed that for the first five years after commissioning, the buyer will be responsible for providing data for use on the outcome indicators on an annual basis, no such ex-post reporting appears to have been supplied.

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
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JC 11.1 Quality and appropriateness of RMS

A logical framework has been prepared for the project (below) but there is no reference to contribution to MDGs (or more recent SDGs). In terms of monitoring of outcome objectives there is no specification of levels of usage of the infrastructure.

Subject	Verifiable Indicators	Means of Verification	Critical Assumptions
Development Objective Socio-economic development	Improved socio-economic situation	PRSP/PARPA Progress Reports	
Immediate Objective Improved access	Increased number of subscribers	TDM annual reports	Business goals are failing
Outputs			
A commissioned and operational backbone system	"Taking over" documents signed		Turnkey supplier not able to deliver
A team of engineers and technicians capable to operate the system	Training courses finalised	Capacity tested	TDM not able to manage
Activities			
Engineering, installation, test, commissioning and operation/maintenance. Training	Progress and status reports	Review of progress reports	Financing secured

Inputs Financing Turnkey supply Approvals	'Loan agreement signed Contract in force license issued
<p>Project implementation monitoring consisted of reporting of implementation progress activities (e.g. construction, training) through to Verification and Takeover. As regards ex-post monitoring the following were specified for operations post-handover but no such reporting (expected for 5 years post-completion) appears to have taken place:</p> <ul style="list-style-type: none"> • Numbers of pending items from commissioning; • Failures; and • Final commissioning after 12 months operation. <p>There has also been no ex-post reporting against Immediate or Development Objectives although regular contract progress reporting, of good quality, has been delivered.</p> <p>JC Rating – Partly satisfactory </p>	
<p>JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio</p>	
<p>M&E and reporting frameworks consistently provide accurate and timely information for implementation management of progress of the project but not of the results/outcomes/impacts of the DSIF investment. Regular progress reporting has been carried out covering major components of works activities. construction, testing, commissioning, training covering such issues as Project Progress (project plan status, detailed site, field survey and design, engineering, FAT (Factory Acceptance Testing), installation, site testing, commissioning, training, EIA); Variations and Change Orders; Claims; Financial Progress and Project Organisation. Reporting continued to Verification of the Works – provisional acceptance testing/commissioning finished May 2009 with financial take-over 15/05/2009 which represented a delay of 10 months.</p> <p>Although it was agreed that for the first five years after commissioning, the buyer will be responsible for providing data for use on the outcome indicators on an annual basis, no such ex-post reporting appears to have been supplied.</p> <p>JC Rating – Partly satisfactory </p>	
<p>EQ 11 Overall Rating – Partly satisfactory </p> <p>A logical framework has been prepared for the project but there is no reference to contribution to MDGs (or more recent SDGs). In terms of monitoring of outcome objectives there is no specification of levels of usage of the infrastructure. Project implementation monitoring consisted of regular, good quality reporting of implementation progress activities (e.g. construction, training) through to Verification and Takeover (provisional acceptance testing/commissioning finished May 2009 with financial take-over 15/05/2009 which represented a delay of 10 months). As regards ex-post monitoring the following indicators were specified for operations post-handover (numbers of pending items from commissioning; failures; and final commissioning after 12 months operation) but no such reporting (expected for 5 years post-completion) appears to have taken place and there has also been no ex-post reporting against Immediate or Development Objectives although regular contract progress reporting, of good quality, has been delivered. Thus, M&E and reporting frameworks consistently provide accurate and timely information for implementation management of progress of the project but not of the results/outcomes/impacts of the DSIF investment.</p>	

Field visits and calls

10.1.1 Introduction

During the field visits (undertaken by José Chiburre, facilitated by Paulino d'Uambo) meetings were held with TMCEL (Moçambique Telecom, SA), INTIC (Instituto Nacional de Tecnologias, Informação e Comunicação – National Institute for Technology, Information and Communication) / MoRENet (Rede de Educação e Pesquisa de Moçambique – Research Network for Education in Mozambique) between 23rd March 2021 and 24th June 2021.

The field mission took place from 23 March to 24 June 2021 in Maputo,

People met: Yunus Esmail (Board Adviser), Armando Mandomando (Board Adviser for the Technical Area), Candido Gobo (Board Adviser for the Technical Area), Moisés Nhabanga (Head of Technical Projects), Prof. Lourino Chemane (CEO INTIC and Former Executive Director for MoRENet) - See annex 1 for the full list.

Institutions interviewed: TMCEL (Moçambique Telecom, SA), INTIC (Instituto Nacional de Tecnologias, Informação e Comunicação – *National Institute for Technology, Information and Communication*) / MoRENet (Rede de Educação e Pesquisa de Moçambique – *Research Network for Education in Mozambique*).

10.1.2 Findings

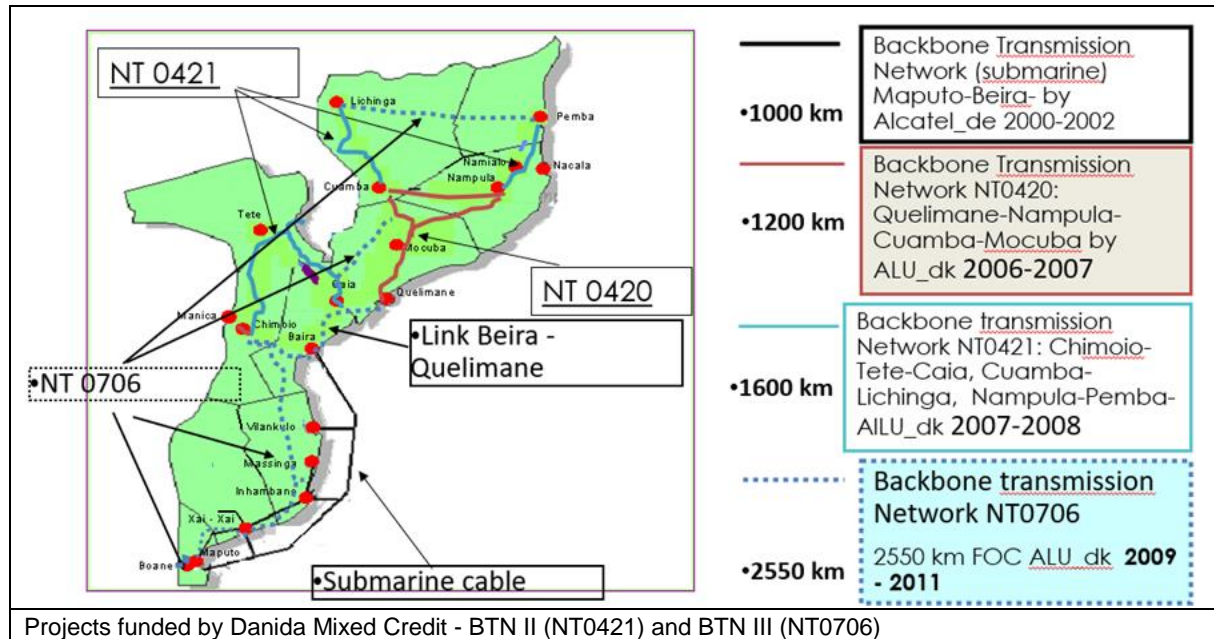
10.1.2.1 Working with Danida

The Report evaluates the implementation Backbone Transmission Network II (BTN II) and Backbone Transmission Network III (BTN III) projects funded by Danida Mixed Credit.

The BTN II was implemented between 2007 and 2009, connecting Cuamba-Lichinga, Nampula-Pemba, Tete-Chimoio, Tete-Caia, Tete-Zóbuè and Chimoio-Machipanda, with a total extension of about 1.600 km (see figure 1, connections indicated with the green line)

The Backbone Transmission II was successful, and that allowed the funding of the phase 3.

The BTN III was implemented between 2009 and 2011, connecting Maputo-XaiXai-Massinga-Inchope, Chimoio-Dondo, Mutarare-Gurue, Lichinga-Pemba, Boane-Goba, with a total extension of 2.550 km (see figure 1 below, connections indicated by the dotted green line).



The main objective of the project for TDM (TMCEL), being the only telecommunications' service provider in the country at the time, was to improve telecommunications services in the country through expansion of the national backbone network, establishment of fibre optical transmission redundancy to back up the fibre optic sea line and connect to inland countries such as Zimbabwe, Malawi, Swaziland, Zambia

The time the project was designed, TDM was 100% state owned company and it merged with MCEL and TMCEL (now 90% State owned company) was created.

At the design of the project, TDM was the only telecommunications company in Mozambique (there were no competitors), and the decision to embark into this project was taken with the intention of providing fibre optic network coverage for all capital cities in Mozambique.

A subcontractor was contracted following national procedures for international tenders, and about 5 to 6 globally recognised telecommunication companies were invited to apply. One of the requisites for the selection of the subcontractor was that the bidders should present the financing solution. Out of the invited companies, Alcatel from Denmark presented a good proposal with attractive financing solution, and it was selected. This is how Danida came in.

The Danida financing proposal was unbeatable as it had subsidized conditions, including 5-year grace period and 10 years payback period. According to TMCEL management, Danida funding was not a commercial financing, instead the financing was meant to benefit the country.

TDM had worked with Alcatel France and Portugal before and they enjoyed a good relationship, and Alcatel Denmark / Danida / TDM was a perfect match as the work progressed smoothly, with technical assistance / knowledge transfer to TDM technicians, provision of adequate equipment including spare parts without delays. TDM also enjoyed good collaboration with Administração Nacional de Estradas – National Road Network Administration (ANE), Electricidade de Moçambique – Mozambique Electricity Company (EDM). All relevant parties played an important role in TDM project as they recognised the need for data transmission for their own activities as well.

The technological choice (underground fibre optic) was the best one. And according to TDM management, they would still choose the same if they were to implement the project today. TMCEL, Vodacom and neighbouring countries use TCM (TMCEL) the fibre optic and it is of recognised top quality (for lower speed)!

The projects had three components:

13. Mechanical excavation (except for some parts where mechanical excavation was not possible) along the road (1,5 meters from the road. About 70% of the project total cost was spent on excavation)
14. Burying of the fibre optic
15. Installation of the equipment at the data centres (mainly in the capital cities)

A total of 4.184 km of fibre optic was placed along the roads (90%) and the railways (10%). The project was especially important, and without the project TMCEL would not exist today.

Before carrying out all the mechanical work, relevant studies such as Environmental Impact Assessment (EIA) and Environmental Management Plan (EMA) were conducted and approved by the Ministry for Coordination of Environmental Affairs (MICOA).

During the project implementation the structure included:

TDM: Owner of the project and supervisor;

Alcatel: Contracted Firm, managed by Hoolf Dan Pfaff;

Kund (from Danida): Monitoring project progress and report to Danida. There were regular coordination meetings between all the parties involved and because of the adequate coordination there were no pending issues nor there was a need for additional funding.

All the planned works were completed accordingly and on time, except for Phase 2 which observed a slight delay.

10.1.2.2 Relationship with Danida and Project Impact

Danida – Mixed Credit funding was the most successful national project for TDM (TMCEL), considering the size, the quality, good relationship with the partner / all the interested parties and the impact of the project. The project was implemented 10 years ago, and until now the network is still operational and functioning well (to its capacity).

Danida was open and cooperative, they did not reject anything from what was projected - they accepted everything, there was no limitation of funds and the whole process was so quick.

The projects (BTN II and BTN III) run very well and there were no issues during and even after the implementation of the project.

10.1.2.3 Competition and TMCEL upgrading Project

From 2014 TDM started to facing competition with mobile communication, first with Vodacom and later Movitel who (both) came into Mozambican market strong and with financial resources. Because of the competition, TDM merged with MCEL to be able to operate both land line and mobile communication.

Because TMCEL believe that they have the best backbone transmission infrastructure, TMCEL designed a new project to upgrade the transmission electronics equipment in the major townships and cities. The upgrade would be done in every 180km distance to ensure adequate and robust network coverage. It is believed that this project will take TMCEL back as the leader in provision of communications services.

For the above-mentioned project, the contract with the financier had been signed, but financing was halted after the issue of Mozambique debt came to public knowledge. According to Eng. Yunus, the World Bank recognised that Mozambique has one of the most modern communication infrastructures, referring to the backbone.

10.1.2.4 Major users (MoRENet and GovNet)

The major users of the fibre optic are MoRENet (Network for Universities / Institutes of Higher Education, Technical Colleges / Schools, Research Institutions) Gov.Net (Network for all government institutions – Ministries, public institutions, provincial directorates, Parque de Ciências e Tecnologias de Maluane – *Maluane Science and Technology Park*, etc). MoRENet which interconnects 180 institutions (additional 103 are in a process of being connected) and Gov.Net interconnecting 700 institutions are the biggest communication networks for the government of Mozambique and use the fibre optic circuits – depend on fibre optic.

According to the major users the capacity of the fibre optic is particularly good, and the network is stable, robust and resilient. However, the coverage is limited, and the quality of the network is only good where there is good coverage.

The transmission electronics equipment placed at the terminals in the capital cities was designed / planned for voice and now it is being used for videos, etc. and it has no capacity to respond to the demand on data.

During the design, the volume of data being transmitted now was not foreseen, hence the existing capacity cannot respond to the current demand on data. For example, in area such as Vilanculo and Chibuto where there are state owned Universities there is no fibre optic and the network is weak. In these areas MoRENet needs about 100MB/s in these areas for online meetings, conference calls, online lessons, etc. and it was supposed to get 100MB/s from two suppliers (one being the main and the other one being backup), but MoRENet can only get 10MB/s from TMCEL, making MoRENet use Vodacom and Movitel networks as the main sources.

MoRENet is establishing additional 103 connections, but for 33 connections it is becoming difficult because the fibre optic coverage doesn't reach those 33 areas which are in the districts in the northern parts of the country.

While the fibre optic is being used extensively, the constrain is that the major user of TMCEL telecommunication system is the government through MoRENet and Gov.Net. These are government institutions are failing to pay their bills to TMCEL, resulting in huge debts. TMCEL is owed a lot of money by the institutions they provide services; and because of that TMCEL also owes substantial amount of money to other companies it relates with.

In the case of MoRENet, the government pay 60% of the total expenses incurred by MoRENet, and MoRENet covers the 40% through fees they received from the Universities who have subsidized tariffs.

10.1.3 Future Plans

Make sure the fibre optic reaches the client through establishment of a metropolitan network.

Upgrade the equipment to be able to provide better services to TMCEL clients, investing in both land and mobile communication.

TMCEL is operating at 3,5G. They recently upgraded to 4,0GB for Maputo and Matola Cities on pilot basis. TMCEL. TMCEL intends to upgrade to 4,0GB across the country.

10.1.4 Challenges

TMCEL doesn't have funds to upgrade the services required, and to get funding there is need to get clearance from the State / Government which reputation is not good at the moment.

Disadvantage of the fibre optic is that when there is a breakdown it takes time to fix because the cables are underground.

Access to technology and basic services such as banking depend on telecommunications; and the fact that the fibre optic doesn't cover the whole country it creates a social exclusion as part of the population, especially those living in rural areas, are denied access to information and other services possible with fibre optic.

10.1.5 Conclusions

The Projects (BTN II and BTN III) were well implemented, the cooperation between the parties involved, including Danida and the subcontractor, was fantastic and the project is having a great impact in the country. Without the Projects, TMCEL would not exist now!

The fibre optic is being used in all the country and in the connections with the inland countries. However, the transmission electronics equipment (purchased based on 2007 / 9 needs) doesn't respond to current demand in data. This results in TMCEL losing to its competitors.

TMCEL designed a project for the upgrade of the transmission equipment but could not access funds due to the country's debt situation.

11 Mozambique – Backbone Transmission Network Phase III – Desk

Overview


Key issues, highlights and lessons learnt	
<p>This project is the third phase of turnkey supply of optical fibre-based transmission network which included engineering, equipment, installation, commissioning and training. All contracts awarded to Alcatel-Lucent. The project is compliant with national poverty reduction and development strategies and with DSIF's overall and cross-cutting objectives. DSIF financing was critical for the bid to go ahead but, given the closeness of the Alcatel and ZTE bids, it is very probable that the project could have gone ahead with ZTE. However, the project was assessed to be both financially and economically marginally viable such that DSIF additionality could be expected to accrue from non-financial considerations such as compliance with environmental requirements (although environmental impacts were predicted to be negligible) and, more importantly from standardisation of equipment used for the network. The project complemented Danish support activities in Mozambique and drew upon the specialised experience and capability of the Danish supplier whose continued involvement should ensure uniformity of equipment throughout the network and standardisation of spares and operational requirements. Environmental impacts are expected to be minimal after short term effects during construction and mitigation measures have been identified. There have been no reported ex-ante/ex-post comparisons and specified outcomes appear not to have been reported post completion. Other indirect but valid development impacts have been discussed even if apparently not monitored including reduced data transmission costs, increased digital accessibility and E-learning for schools and high education.. An economic analysis assessed economic benefits as 'considerable' noting that telecoms projects can, in general, have a major positive impact on national socio-economic development. Basically implementation risks were discounted on the basis of good experiences in implementing previous phases. Longer term viability and sustainability risks are linked to TMCEL financial situation which, in turn, is linked to constraints on TMCEL in accessing finance and setting of cost-recovery tariffs thus potentially permitting access to the market by other players. This financial situation is fragile as there is reported to be large, backlogged payment by GoM institutions for fibre optic services which has resulted in cash-flow problems for TMCEL and potential threat to O&M of the network. Although some output and outcome indicators have been specified no monitoring reports (other than the Verification Report) have been scrutinised by the evaluation [according to the Verification Report no such reporting on output indicators was actually carried out by TMCEL] but it has been reported to the evaluation that such monitoring of implementation was adequate for contract progress reporting.</p>	

Summary	
Project name	Backbone Transmission Network III
Type of project	Telecoms
Project No.	104.O.30.Mozambique
Description	<p>Supply and installation of fibre-based telecommunication backbone transmission network connecting the geographical sites:</p> <ul style="list-style-type: none"> • Massinga – Inchope – new line • Mutarara – Gurué – upgrading fibre-optic line • Pemba – Lichinga – upgrading fibre-optic line • Dondo – Chimoio – upgrading fibre-optic line • Boane – Goba – upgrading fibre-optic line • Maputo – Xai Xai – Massinga – upgrading fibre-optic line <p>The overall rationale for the project is to obtain fibre optical transmission redundancy and expand capacity for the last parts of the national backbone network. At the same time a number of important district capitals will be fibre optical connected and the backbone will be ready to receive regional and international transit traffic from Swaziland, Botswana, Zimbabwe, Malawi and Zambia, which are all planned to be connected to the coming East Africa Submarine System (EASSy) through Maputo. Full redundancy of the Mozambican backbone is a condition for Maputo to become an international connecting point. Presently a cut in the fibre optical sea cable would be a disaster. The traffic in Mozambique alone today is too high to be replaced by satellite or micro wave.</p> <p>The project applies SDH network technology and fibre optic cable. The physical contents include 2,585 km of fibre optic cables in ducts, 44 equipment locations with multiplexers, shelters power supply and tools, Further, on training, spares and documentation are supplied.</p>
Sector	Telecoms
Country	Mozambique
Sponsor	Ministry of Finance, Mozambique

Summary																																																						
Other stakeholders	Telecomunicações de Moçambique SARL (TMCEL)																																																					
Clearance in principle	15/12/2008																																																					
Approval/Binding Commitment	01/04/2009 (Final Mixed Credit Appraisal)	Loan / Investment Agreement Date			18/02/2009																																																	
Danish Bank																																																						
Loan Duration + Grace Period	10 years – 0 Grace period																																																					
Project Amount and funding plan	DKK155,61 million - Concessionality50%																																																					
Danish Exporter	Alcatel-Lucent Denmark A/S																																																					
MFA guarantee	Date		Amount	62%	Duration	10 years																																																
Implementation status	The Final Acceptance Certificate was signed 22 November 2013 and granted effective date is 31 August 2013.																																																					
Feasibility study details	Appraisal Report on Rural Telecommunications Project, Phase 3 Mozambique - 23 February 2009 - HAP Consultants Denmark																																																					
Subsidy – rationale and key features	PROJEKTBEVILLING 15/12/2008 Financial data: <table border="1"> <thead> <tr> <th><i>Financial data</i></th> <th>DKK/million</th> <th>€/million</th> </tr> </thead> <tbody> <tr> <td>Amount financed</td> <td>155,61</td> <td></td> </tr> <tr> <td>Loan Amount</td> <td>124,53</td> <td></td> </tr> <tr> <td>Maturity</td> <td>10 years</td> <td></td> </tr> <tr> <td>Grace</td> <td>0</td> <td></td> </tr> <tr> <td>Total Subsidy Element</td> <td>50,04% (OECD)</td> <td></td> </tr> <tr> <td>Total grant Cost (DKK/USD - €7,45)</td> <td></td> <td>12,98</td> </tr> <tr> <td>Total</td> <td>96,78</td> <td></td> </tr> <tr> <td>Interest Rate Subsidy (CIRR + 0,2 = 4,97)</td> <td>31,37</td> <td>4,21</td> </tr> <tr> <td>EKF Premium</td> <td>14,61</td> <td>1,96</td> </tr> <tr> <td>Bank Margin</td> <td>2,59</td> <td>0,35</td> </tr> <tr> <td>Extra Grant Amount</td> <td>31,08</td> <td>4,17</td> </tr> <tr> <td>Appropriation for Technical Assistance</td> <td>1,00</td> <td>0,13</td> </tr> <tr> <td>Budget Margin 20%</td> <td>16,13</td> <td>2,16</td> </tr> <tr> <td>Total Budget</td> <td>155,61</td> <td></td> </tr> <tr> <td>Total Project Investment</td> <td>155,61</td> <td></td> </tr> </tbody> </table>						<i>Financial data</i>	DKK/million	€/million	Amount financed	155,61		Loan Amount	124,53		Maturity	10 years		Grace	0		Total Subsidy Element	50,04% (OECD)		Total grant Cost (DKK/USD - €7,45)		12,98	Total	96,78		Interest Rate Subsidy (CIRR + 0,2 = 4,97)	31,37	4,21	EKF Premium	14,61	1,96	Bank Margin	2,59	0,35	Extra Grant Amount	31,08	4,17	Appropriation for Technical Assistance	1,00	0,13	Budget Margin 20%	16,13	2,16	Total Budget	155,61		Total Project Investment	155,61	
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Country Context	<p>GoM's goal was to create access to modern telecommunications services for all the country's inhabitants as a basis for increasing economic growth and employment by implementing a comprehensive modernization of the infrastructure with the expansion and digitization of the telephone network into a complete nationwide broadband network. The government's strategy also included full market liberalization as well as a strengthening of the sector's regulatory authority, the Instituto Nacional das Comunicações de Moçambique (INCM), to ensure competitive prices for consumers. Liberalization took place gradually and the full liberalization of the market was achieved in January 2008, when the state telephone company Telecomunicações de Moçambique (TMCEL) was deprived of its monopoly on fixed telephony. There are a number of private companies, including the large South African company Vodacom, which, in line with liberalization, have appeared on the market to offer telecommunications services.</p> <p>The first part of the extensive expansion of the network included the establishment of an optical tele-submarine cable in 2003 between the capital Maputo and the country's second largest city Beira, as well as a radio chain connection from Beira to the city of Manica, financed by the Development Bank of South Africa and the German Kreditanstalt für Wieder Construction. In 2004/2005, Beira was connected to the city of Quelimane by an EU-funded fibre optic cable. The last part of the modernization program was to be implemented in three phases. The first and second phases are financed with Danish mixed credits and included the laying of optical fibre cables in the central and northern provinces to connect the provincial towns to the nationwide network. The first phase was completed in March 2008 and the second phase (BTN 2) was handed over at the end of 23.008. The first and second phases amount to DKK</p>																																																					

Summary	
	<p>94,8 and 111,61 million, respectively. DKK in financed contract amount and are both performed by the Danish company Alcatel-Lucent Danmark A / S. The third and final phase (i.e. this project BTN 3) completes the nationwide broadband network partly by connecting missing geographical areas and partly by strengthening and connecting missing links in the broadband network so that the ring is completed and closed.</p> <p>The project comprised the following components:</p> <ol style="list-style-type: none"> 5. Laying of 2.585 km of optical fibre cable (ground cable) for broadband connection <ul style="list-style-type: none"> o Massinga-Inchobe (Southern and Central Provinces) o Mutarara-Guruè (central provinces) o Pemba-Lichinga (northern provinces) o as well as on the following lines as a replacement for existing radio chain with broadband connections: <ul style="list-style-type: none"> o Dondo-Chimoio (central provinces) o Maputo-Xai-Xai-Massinga (Southern Provinces) o Boane-Goba (Southern Province) 6. Establishment of 44 transmission and distribution centres 7. Connection to the existing Network Management System, established under the two previous mixed credit projects 8. Training package including operation and maintenance <p>With the third phase, important geographical rural areas were also connected, which enabled connection of a total of ~ 80 district towns and villages that were without telecommunication connections. With these lines, the nationwide broadband network would be fully complemented and could provide reliable telecommunications with wide coverage, capacity and reliability. With this third and final phase, full redundancy was also achieved for the entire transmission network, which ensured high performance and ensured against long-term and costly interruptions in traffic. Full redundancy in the network was also a prerequisite for Mozambique's participation in the "East Africa Submarine System" (EASSy), to establish a broadband cable connection from South Africa to Djibouti by submarine cable. In this major project, Maputo is to be a hub for regional traffic from Swaziland, Botswana, Zimbabwe, Malawi and Zambia.</p>

Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The project was compliant with the GoM poverty reduction strategy and was ranked high on GoM priorities and satisfied DSIF overall and cross-cutting objectives whilst being compliant with Danida's policy for telecommunication. The project was considered complementary to Danish education and health sector programmes in Mozambique and contributed to employment, income generation, improved living conditions and viable economic growth. Relevant expertise for project implementation was available in Denmark and a contract was signed with Alcatel-Lucent. The project was estimated to be non-commercially viable but economically viable plus organisationally, technically and financially sustainable</p> <p><u>Contribution to poverty reduction (target groups, employment and geography)</u></p> <p>The direct beneficiary is TMCEL and the project supports the company's viability in a situation the telecommunication market has been fully liberalised. Indirect beneficiaries were private households and business entities, including other telecommunications operators, in the project areas, which would get access to both improved and new services in Cabo Delgado, Niassa, Nampula and Zambezia (which are the poorest provinces in the country housing almost half the country's population). Indirectly the whole population of Mozambique potentially benefited from the projects establishment of full redundancy, which made the backbone system more reliable and robust. Direct employment would be minor, but the indirect employment and income generation was assessed to be significant.</p> <p>JC Rating - Satisfactory </p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	
<p>Alignment with national development policies was confirmed.</p> <p>The Government's policy for the telecommunication sector aimed at achieving universal access thus contributing to socio-economic development of the country and poverty reduction. The telecommunication market had been fully liberalised and the regulatory authority for the sector INCM has strong regulatory mandates. INCM also managed the Universal Access Programme for implementation of telecommunication access to rural areas supported by World Bank and a 1% levy on the turnover of all telecommunication providers. GoM actively supported telecommunication development through implementation of E-Government, encouraging institutions of education to introduce emerging telecommunications technologies in their course curricula and supporting TMCEL in establishing the countrywide fibre optical backbone network.</p>	

The rationale for BTN 3 was to achieve fibre optical transmission redundancy for the last parts of the backbone network. At the same time a number of important district capitals would be fibre optical connected, and the backbone would be ready for regional traffic from Swaziland, Botswana, Zimbabwe, Malawi and Zambia, connected to the East Africa Submarine System (EASSy) through Maputo. Full redundancy of the Mozambican backbone was a condition for Maputo to become an international connecting point and traffic in Mozambique alone is too high to be replaced by satellite or micro wave.


TMCEL realised that the national backbone network, in its expanded configuration and strategic importance required additional measures in the field of operation and maintenance (O&M). Consequently, TMCEL developed a new O&M strategy based on two main objectives: 1) Cutting down the repair time for emergency and corrective maintenance and 2) Ensuring high quality of service to customers.

Project Objectives and Strategy

The aim of the backbone project as a whole was to establish a cost effective, countrywide, coherent, modern and powerful backbone network and this Phase 3 project is the final element in achieving this aim. The strategy paper "An Overview of the National Backbone Transmission Network Development Programme 200-2010 for Central and Northern Provinces", of May 2004, defined the Overall Objective of the programme as: 'Socio-economic development supported by facilitating increased opportunities for economic diversification, employment, regional integration and contributing to increased efficiency in most social and economic activities'.

with Immediate Objective as:

Improved access to telecommunications services in the Southern, Central and Northern Provinces by increased coverage, capacity and safety against fatal transmission interruptions (system redundancy). System capability established to attract and carry international transit traffic.

JC Rating - Satisfactory 

JC 1.3 Added value of Project Preparation Facility (PPF)


No reference is made to the PPF (Project Preparation Facility) as the contract was essentially a 'design and build' contract with detailed design undertaken by the contractor.

JC Rating – N/A

JC 1.4 Complementarity with development partners operations and strategies

There was complementarity with other development partners operations and strategies.


- The EU funded a USD 10 million rural telecommunication project for Gaza and Inhambane Provinces for extension of the existing rural telecommunications network to 39 districts and rural towns within these provinces. The project was tendered in 2003 and completed at the end of 2008⁸³.
- BADEA funded a USD 5 million project in Tete Province (similar to the EU project) completed mid-2007.
- Export Import Bank of China financed a USD 25 million project managed by TMCEL to connect 42 district towns with the fibre optical backbone by micro wave. The project was tendered in China only, and bids were received from the two Chinese companies bidding for BTN Phase 3.
- World Bank supported the Universal Access Programme aimed at bringing telecommunication services, voice and data to all people in Mozambique through subsidisation financed from the Universal Access Fund (built up from a 1% levy on the total yearly revenues of all telecommunication providers and grants from the donor community).

JC Rating – Satisfactory 

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

Good alignment with MFA and national development policies and strategy including identified development objectives is discussed in JCs 1.1 and 1.2 above.

This is a follow on project from Phase 2

JC Rating – Satisfactory 





EQ 1 Overall Rating – Satisfactory

The project, as a de facto continuation of previous Danida financing of the Backbone Transmission Network in Mozambique is compliant with national poverty reduction and development strategies and with Danida's overall and cross-cutting objectives including Danida telecoms policy. The project was estimated to be non-commercially viable but economically viable plus organisationally, technically and financially sustainable

EQ 2 -Coherence




To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?

⁸³ According to TDM the development of telecommunication technology has long left behind the technology used in the project, and the money appears to almost have been wasted. Source: *Appraisal Report on Rural Telecommunications Project, Phase 3 Mozambique - 23 February 2009 - HAP Consultants Denmark*

JC 2.1 Systematic research for coherence with MFA development policies and strategy
<p>The project, which was a continuation of previous support to telecoms in Mozambique, was in compliance with GoM poverty reduction strategy (and was ranked high on the GoM's list of priorities) satisfies MFA and DSIF policies including overall and cross-cutting objectives and policy for telecommunication. The project was identified as complementary to Danida's education and health sector support programmes in Mozambique (albeit that the education was identified to be explicitly phased out for donor funded support) and contributed to (indirect) employment generation (there would be little direct employment generation after construction), improved living conditions, and viable economic growth. Relevant expertise for project implementation was available in Denmark and a contract was signed with Alcatel/Lucent. The project was found to be commercially non-viable but economically viable and organisationally, technically and financially sustainable.</p> <p>JC Rating – Satisfactory </p>
JC 2.2 Synergies /complementarity with other Danish development initiatives
<p>BTN 3 was prepared during the period of coverage of the Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011) which identified focal sectors Agriculture, Environment and Health (GBS M/financial support) whilst identifying some sectors explicitly to be phased out (for grant funded support) i.e. Energy and Education. The project was a continuation of 'old' telecoms sector programmes, most recently BTN 2, but under the 1995-1999 Strategy for Danish Bilateral Cooperation 'Telecoms' was identified as a sector to be explicitly phased out (for grant funded support).</p> <p>JC Rating – Partly satisfactory </p>
JC 2.3 Danish business links with beneficiary countries
<p>The project network included interface terminals and equipment to connect to and integrate with the Telecommunications Management Network (TMN) which was established as part of the two other Danida financed projects. The TMN allowed monitoring of network performance, fault detection and analysis and setting up and disconnecting subscriber connections. The TMN system is propriety system element which means that the TMN and the TMN transmission equipment must be from the same manufacturer. By using Alcatel/Lucent in this project, a nationwide TMN was applied for the backbone system with advantages of standardised spare parts and training. Since Alcatel was the supplier of the backbone project and had performed satisfactorily in previous projects there were strong grounds for the contract to be awarded to Alcatel (notwithstanding the tender evaluation which found effectively a dead-heat between Alcatel/Lucent and ZTE bids. However reservations were expressed about the procurement procedures. The project (BTN 3) had a tender launched Autumn 2007 and a conditional commercial contract was signed with Alcatel/Lucent 25th July 2008 with the aim of obtaining funding under the Danish Mixed Credit Facility with TMCEL as the implementing agency. The Mixed Credit Committee found that the proposed project would in principle be eligible for support under the Mixed Credit facility and a pre-appraisal mission to Mozambique during the period 7 to 18 September 2008 was undertaken to establish a basis to decide on whether to support the project. The pre-appraisal was completed by a Danida desk appraisal. A conditional contract had been signed between Alcatel/Lucent and TMCEL for BTN Phase 3 project after a tender evaluation process comprising three companies: Alcatel/Lucent, ZTE Corporation (China) and Nokia Siemens. Although the pre-appraisal team in general found the evaluation somewhat biased to the advantage of Alcatel an objective exercise did not change the result. The objective evaluation resulted in a dead heat between Alcatel/Lucent and ZTE Corporation and since Alcatel had been the supplier to previous phases of the backbone project and performed satisfactorily, the pre-appraisal supported the evaluation choice of TMCEL that the contract should be awarded to Alcatel⁸⁴.</p> <p>TMCEL was the implementing agency of this project.</p> <p>Technically the project comprised a number of backbone transmission systems/lines based on Synchronous Digital Hierarchy (SDH) network technology, which is a set of international standards for broadband communications over single mode fibre optic transmission systems, is proven by decades of market performance. The SDH technology which is expected to remain a major standard for the next decades to come. SDH was also used for previous Danida financed projects. Danish firms have significant experience and capability in this field of telecoms.</p> <p>JC Rating – Satisfactory </p>
<p>EQ 2 Overall Rating – Satisfactory </p> <p>The project, which was a continuation of previous support to telecoms in Mozambique and was in compliance with GoM poverty reduction strategy satisfied MFA and DSIF policies and complemented Danish support</p>


⁸⁴ The conditional contract between Alcatel and TDM was not FIDIC as normally required by Danida. However, it included all main contract elements and had the same contents as the contracts for Phases I and II of the backbone financed under Danish Mixed Credit and thus it was recommended that DSIF should accept the proposed contract format subject to inclusion of all requirements listed in "General Guidelines for the Approval of Commercial Contracts under Danish Mixed Credit".

activities in Mozambique drawing upon the specialised experience and capability of the Danish supplier whose continued involvement should ensure uniformity of equipment throughout the network and standardisation of spares and operational requirements. The project network included interface terminals and equipment to connect to and integrate with the Telecommunications Management Network (TMN) which was established as part of the two other Danida financed projects. By using Alcatel/Lucent in this project, a nationwide TMN was applied for the backbone system with advantages of standardised spare parts and training.

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
The FIRR was estimated at ~8% and the project was not commercially viable. DSIF's financial additionality was principally in the form of a subsidised loan and grant package. No commercial or development bank finance was involved.	
JC Rating - Satisfactory 	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
There is evidence of DSIF additionality including: <ul style="list-style-type: none"> • compliance with national environmental regulations (although it was noted that 'Environmental impacts during construction and operation of the project are considered to be insignificant and TMCEL has experience from earlier projects in achieving the environmental license required'). • coverage of cross-cutting issues would essentially address environmental, gender, HIV/AIDS, fundamental work rights (in compliance with the ILO Declaration on Fundamental Principles and Rights at Work) • project detailed design (covered by the construction contract package – design and build contract) • training was also included in the contract package (i.e. as part of the project delivery, in order to ensure a satisfactory commissioning of the system and the future operation and maintenance). The field visit in Q2 2021 found that DSIF additionality as perceived by TMCEL was: <ul style="list-style-type: none"> • DSIF funding was the most successful national project for TMCEL (TMCEL), considering the size, the quality, good relationship with the partner / all the interested parties and the impact of the project. The project was implemented 10 years ago, and until now the network is still operational and functioning well (to its capacity)⁸⁵. • Danida was open and cooperative, they did not reject anything from what was projected - they accepted everything, there was no limitation of funds and the whole process was so quick. • The projects (BTN II and BTN III) run very well and there were no issues during and even after the implementation of the project. 	
JC Rating –Satisfactory 	
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	
No other sources of financing were mobilised.	
JC Rating – N/A	
EQ 5 Overall Rating – Satisfactory 	
The appraisal found the project to be both financially and economically marginally viable such that DSIF additionality could be expected to accrue from non-financial considerations such as compliance with environmental requirements (although environmental impacts were predicted to be negligible) and, more importantly from standardisation of equipment used for the network. There was no expected catalytic effect as no other source of financing was involved and this was the final phase of network development anyway.	

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
The Verification Report (Netplan A/S) confirmed: <ul style="list-style-type: none"> • Effective date of contract was 15/06/2009, the project implementation period was June 2009 to August 2011 with Defect Notification Period August 2011 to August 2013. • Final Acceptance Certificate dated 22/11/2013 (Effective Date 31/08/2013). • The delivery comprises 2.585 km fibre optic cable and 44 stations equipped with transmission electronics and power supply. The Verification conclusions were: <ul style="list-style-type: none"> • No contractual disputes escalating to formal claims during the project period. 	

⁸⁵ But see reference to line cuts and TDM O&M capacity in JC 6.1 below

- Except for the delay on the line Lichinga – Pemba caused by the road authorities at the section between Marrupa - Montepuez, in total 215 km, and for which a MOU (Change Order No. 10) was worked out between the parties
 - No findings of critical deviations or irregularities.
 - All Provisional Acceptance Certificates for the 12 system segments which were not signed have been cleared by issuing and signing one Provisional Acceptance Certificate for the project in total.
 - No remaining unsettled deficiencies.
 - Work on the undone line Marrupa - Montepuez has not been started due to prohibited access due to delay caused by the Road Authorities. Latest information from the Road Authorities grants access only from September 2014.
 - Line cuts of the optical fibre caused by the Road Authorities have reached a critical level on some network sections, where network function will be influenced. It might be critical for TMCEL to handle the repair work themselves.
 - The Operation & Maintenance department seems to lag capability, and TMCEL has not at an early stage realized the demand of maintaining a 5.500km long fibre optic back bone network.
- The field phase (Q2 2021) report noted that *'The project was implemented 10 years ago, and until now the network is still operational and functioning well (to its capacity)'* and *'According to the major users the capacity of the fibre optic is particularly good, and the network is stable, robust and resilient'*.
- JC Rating – Partly Satisfactory 

JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)

Direct employment generation was assessed as 'minor' but indirect employment and income generation was assessed as significant, contributing to employment, income generation, improved living conditions and viable economic growth. Beneficiaries of BTN 3 are the population potentially gaining access to the backbone network in Cabo Delgado, Niassa, Nampula and Zambezia which are the poorest provinces in the country. Indirectly the whole population of Mozambique potentially benefits from the projects establishment of full redundancy, which makes the backbone system more reliable and robust. Improved access to contemporary telecommunication services, particularly internet at affordable prices is supportive to democratisation and E-government which aims to bring all levels of government and all public institutions more effectively into the yearly planning and budget process and support the on-going decentralisation of government.

The reality as observed during the field phase is:

- The fibre optic network is being used throughout the country and in the connections with the inland countries. However, the transmission electronics equipment (purchased based on 2007/9 needs) does not respond to current demand in data.
- Access to technology and basic services such as banking depend on telecoms but the fibre optic network does not cover the whole country and there is a social exclusion for part of the population, especially those living in rural areas denied access to IT services possible with fibre optic connectivity-. MoRENet is establishing an additional 103 connection, but for 33 of these connections it is difficult because the fibre optic coverage doesn't reach those 33 areas which are in districts in the northern parts of the country.
- The major users of the fibre optic network are MoRENet (Network for Universities/Institutes of Higher Education, Technical Colleges/Schools, Research Institutions) Gov.Net (Network for all government institutions – Ministries, public institutions, provincial directorates, Parque de Ciências e Tecnologias de Maluane – Maluane Science and Technology Park, etc). MoRENet which interconnects 180 institutions (with an additional 103 being connected) and Gov.Net interconnecting 700 institutions are the biggest communication networks for GoM and use the fibre optic networks.
- According to the major users the capacity of the fibre optic network is good the network is stable, robust and resilient although coverage is limited.
- The transmission electronics equipment placed at terminals in capital cities was designed/planned for voice and now is being used for streaming etc and it has no capacity to respond to the demand for high levels of data transmission. At design, the volume of data being transmitted now was not foreseen, hence the existing capacity cannot respond to the current demand⁸⁶.

JC Rating – Partly satisfactory 

JC 6.3 Environmental, social and governance (ESG) risk management

An approved ESIA was a condition for Danida financing even though environmental impacts during construction and operation were assessed as 'insignificant' (this finding was confirmed by ESIA reports from preceding phases). Identified environmental and social issues (mainly during construction) were identified together with mitigation measures i.e. loss of vegetation, soil erosion, compaction and pollution, water pollution, loss of access to land, infrastructure and properties, interference with habitation and buildings


⁸⁶ For example, in Vilanculo and Chibuto areas where there are universities there is no fibre optic connection and the network is weak. In these areas MoRENet needs about 100MB/s for online meetings, conference calls, online lessons, etc. and it was expected to get 100MB/s from two suppliers (one main and one backup supplier), but MoRENet can only get 10MB/s from TMCEL, with the result that MoRENet uses the Vodacom and Movitel networks as the main service providers.

occupying public land along the road, conflicts between the project works and the local communities. The contractor sensitised workers in correct behaviour in order to avoid conflicts, proliferation of HIV/AIDS and other diseases, disruption of normal traffic, fall of people and livestock in the trenches: and interference with archaeological and historical sites.

Most of the potential negative impacts were socio-economic, such as loss of access to land, infrastructure and properties, and interference with habitations and buildings occupying public land along the road.

Interference with the environment was to a large extent mitigated by the type of technology and equipment applied. Moreover, there were no labour camps and there was no use of explosives.

Questions regarding rights of way where land was occupied by farming and habitations was treated with special caution under the guidance of concerned Government agencies (disagreements with the community could lead to in-viability of the project due to sabotage of the infrastructure installed).

JC Rating – Satisfactory 

JC 6.4 Contribution to climate change mitigation, green and inclusive development

Negligible effects on climate change. Contributed to economic and social development in rural areas in Mozambique.

JC Rating – Satisfactory 

JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

As the project predated the Helsinki Principles, there was no explicit consideration of low carbon and climate resilience growth. However, this project has been assessed of having negligible direct long term environmental impact (as the fibre optic cables are buried) and limited short term environmental impacts were adequately mitigated during construction.

JC Rating – N/A

EQ 6 Overall Rating – Partly Satisfactory

The Verification Report (Netplan A/S) confirmed delivery of 2585 km fibre optic cable and 44 stations equipped with transmission electronics and power supply [Final Acceptance Certificate dated 22/11/2013 (Effective Date 31/08/2013)]. The Verification Report also noted that line cuts of the optical fibre caused by the Road Authorities have reached a critical level on some network sections, where network function will be influenced and that the TMCEL Operation & Maintenance department lacked capability and that TMCEL (despite training in O&M delivered under both BTN 2 and BTN 3) had not at an early stage realized the demand of maintaining a 5500km long fibre optic back bone network.

In terms of expected outcomes (in targeted beneficiary populations or more widely) direct employment generation was assessed as 'minor' whilst indirect employment and income generation was estimated to be significant. The project was compliant with the GoM poverty reduction strategy (PARPA) and it was ranked high on the GoM's list of priority and contributed to employment, income generation, improved living conditions and viable economic growth.

The direct beneficiary of the project was TMCEL. Indirect beneficiaries were private households and business entities, including other telecommunications operators, in the project areas, which potentially have access to both improved and new services. Other beneficiaries of BTN 3 are the population potentially gaining access to the backbone network in Cabo Delgado, Niassa, Nampula and Zambezia which are the poorest provinces in the country. Indirectly the whole population of Mozambique potentially benefits from the projects establishment of full redundancy, which makes the backbone system more reliable and robust.

Improved access to contemporary telecommunication services, particularly internet at affordable prices is supportive to democratisation and E-government.


However, indicators for outcomes refer only to technical performance of the network but indirect outcomes are discussed in project documentation (even if not monitored or quantified). Whilst the wider indirect benefits are not disputed, the concept of large populations in the poorest provinces in the country benefitting to any great degree from access to fibre optic communication appears somewhat idealistic.

Environmental impacts are expected to be minimal after short term effects during construction and mitigation measures have been identified although an approved ESIA was a condition for DSIF financing. Most of the identified potential negative impacts were socio-economic, such as loss of access to land, infrastructure and properties, and interference with habitations and buildings occupying public land along the road. Interference with the environment was to a large extent mitigated by the type of technology and equipment applied. There were no labour camps and there was no use of explosives. Questions regarding rights of way where land was occupied by farming and habitations were treated with special caution under the guidance of concerned Government agencies

No reference to climate change or to ex-ante/ex-post comparisons and there was no explicit consideration of low carbon and climate resilience growth. However, the current situation as observed during the field phase is:

- The fibre optic network is being used throughout the country and in the connections with the inland countries. However, the transmission electronics equipment does not respond to current demand in data.
- Access to technology and basic services such as banking depend on telecoms but the fibre optic network does not cover the whole country and there is a social exclusion for part of the population, especially those living in rural areas denied access to IT services possible with fibre optic connectivity. MoRENet is

<p>establishing an additional 103 connection, but for 33 of these connections it is difficult because the fibre optic coverage does not reach those 33 areas which are in districts in the northern parts of the country.</p> <ul style="list-style-type: none"> • The major users of the fibre optic network are MoRENet (Network for Universities/Institutes of Higher Education, Technical Colleges/Schools, Research Institutions) Gov.Net (Network for all government institutions – Ministries, public institutions, provincial directorates, Parque de Ciências e Tecnologias de Maluane – Maluane Science and Technology Park, etc). MoRENet which interconnects 180 institutions (with an additional 103 being connected) and Gov.Net interconnecting 700 institutions are the biggest communication networks for GoM and use the fibre optic networks. • According to the major users the capacity of the fibre optic network is good the network is stable, robust and resilient although coverage is limited. <p>The transmission electronics equipment placed at terminals in capital cities was designed/planned for voice and now is being used for streaming etc and it has no capacity to respond to the demand for high levels of data transmission. At design, the volume of data being transmitted now was not foreseen, hence the existing capacity cannot respond to the current demand.</p>
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EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)	
<p>It was agreed that indicator monitoring and reporting to Danida would take place yearly during a period of 5 years after commissioning [and TMCEL's responsibility in this regard was included and confirmed in the buyer's declaration]. However, no monitoring and reporting of outcome indicators has been scrutinised by the evaluation nor any comparison between ex-ante and ex-post situations.</p> <p>Development impacts identified included:</p> <ul style="list-style-type: none"> • Data transmission cost to decrease significantly and make internet access affordable for larger parts of the population • The increased accessibility and data transmission speed support the GoM decentralisation policy, and its plan to link all public entities in the country, from district level and up, to GOVNET – in practice (as found during the field phase) the fibre optic network is being used throughout the country and in the connections with the inland countries; however, the transmission electronics equipment does not respond to current demand in data and, according to the major users the capacity of the fibre optic network is good the network is stable, robust and resilient although coverage is limited. • Planning and monitoring of development projects and programmes at all Government levels to be more efficient through internet communications - in practice (as found during the field phase) the transmission electronics equipment placed at terminals in capital cities was designed/planned for voice and now is being used for streaming etc and it has no capacity to respond to the demand for high levels of data transmission. • The Provincial Centres for Digital Resources and the District Community Multimedia Centres supported by the Government offer more informatics training for a lower price • E-learning significantly increased when the capacity allows use of interactive teaching programmes • Internet to come to primary and secondary schools, health centres and hospitals - in practice (as found during the field phase) the major users of the fibre optic network are MoRENet (Network for Universities/Institutes of Higher Education, Technical Colleges/Schools, Research Institutions) Gov.Net (Network for all government institutions – Ministries, public institutions, provincial directorates, Parque de Ciências e Tecnologias de Maluane – Maluane Science and Technology Park, etc). MoRENet which interconnects 180 institutions (with an additional 103 being connected) and Gov.Net interconnecting 700 institutions are the biggest communication networks for GoM and use the fibre optic networks <p>These identified development outcomes/impacts are indeed valid but specified outcome indicators would only capture a limited proportion (if they were reported upon that is) i.e. Specified Outcomes: Increase in traffic from Phase 3 lines; Number of leased lines (2Mbits and 64Kbits) on Phase 3 lines; Number of regional 2Mbit lines for transit traffic</p> <p>JC Rating – Satisfactory </p>	
JC 7.2 Strong ESG performance of DSIF projects	
<p>No comparisons between ex-ante and ex-post ESG have been examined by the evaluation although considering that negative environmental impacts arising from construction and operation are assessed as 'insignificant' this issue is not considered to be potentially serious. Indirect benefits expected included a positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government given that limited access to telecommunications services in the Central and Northern Provinces had been identified as a barrier for social and economic development in these provinces. To a large extent the field visit reports that these expected benefits have been delivered albeit with some reservations about coverage) i.e.</p> <ul style="list-style-type: none"> • The fibre optic network is being used throughout the country and in the connections with neighbouring countries although the transmission electronics equipment does not respond to current demand in data. 	

- Access to technology and basic services such as banking depend on telecoms but the fibre optic network does not cover the whole country and there is a social exclusion for part of the population, especially those living in rural areas.
- The major users of the fibre optic network are MoRENet and GOVNET. MoRENet interconnects 180 institutions (with an additional 103 being connected) and Gov.Net interconnects 700 institutions. According to the major users the capacity of the fibre optic network is good the network is stable, robust and resilient although coverage is limited.
- The transmission electronics equipment placed at terminals in capital cities was designed/planned for voice and now is being used for streaming etc and it has no capacity to respond to the demand for high levels of data transmission.

JC Rating – Satisfactory 

JC 7.3 Satisfactory financial returns and portfolio performance

It was concluded at Appraisal stage that the financial situation of TMCEL was moderate. The company produced reported annual net profits in the range USD 3-7 million, and its cash flow allowed it to make yearly investments from own sources to the tune of USD 10-15 million. This was less than increasing needs and the company was depending mostly on soft loans and possible grants from the Government and the donor community to satisfy the demands for telecommunications services. Organisationally TMCEL was considered to be strong and sustainable with competent management proven to have the necessary ability to plan, implement and operate the project. Against this background BTN 3 was considered to be viable and sustainable with considerable economic benefits. However, current financial reports and performance give cause for concern. An economic analysis was carried out and the analysis noted problems in quantifying socio-economic benefits while observing that telecommunications projects can have positive impacts on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government. However, a number of derived benefits such as increased employment, increased literacy and reduced infant mortality as result of better and faster information were not included in the analysis. The project was thus found to be commercially non-viable but economically viable. It was expected that the project would be able to cover operation and maintenance costs and to pay back the loan from the revenue generated by usage of the project infrastructure. However, during the field phase it was reported that whilst the fibre optic network is being used extensively, a constraint is that the major current users of the TMCEL telecoms system are government institutions which are failing to pay TMCEL services, resulting in debts and in turn TMCEL also owes substantial amounts to other companies. There is thus a very real threat to longer term economic viability.

JC Rating – Partly satisfactory 

EQ 7 Overall Rating – Satisfactory


It was agreed that indicator monitoring and reporting to Danida would take place yearly during a period of 5 years after commissioning. However, no monitoring and reporting of outcome indicators has been scrutinised by the evaluation nor any comparison between ex-ante and ex-post situations.

Development outcomes/impacts identified are indeed valid i.e. cheaper data transmission cost to make internet access affordable for larger parts of the population; increased accessibility and data transmission speeds supporting GoM decentralisation policy; planning and monitoring of projects and programmes at all levels more efficient through internet communications; Provincial Centres for Digital Resources and District Community Multimedia Centres would offer more informatics training for a lower price; E-learning significantly increased through use of interactive teaching programmes; internet to primary and secondary schools, health centres and hospitals. However, the specified limited number of outcome indicators would only capture a limited proportion (if they were reported upon that is). To a large extent the field visit reports that these expected benefits have been delivered albeit with some reservations about coverage) i.e.

- The fibre optic network is being used throughout the country and in the connections with neighbouring countries although the transmission electronics equipment does not respond to current demand in data.
- Access to technology and basic services such as banking depend on telecoms but the fibre optic network does not cover the whole country and there is a social exclusion for part of the population, especially those living in rural areas.
- The major users of the fibre optic network are MoRENet and GOVNET. OoRENet interconnects 180 institutions (with an additional 103 being connected) and Gov.Net interconnects 700 institutions. According to the major users the capacity of the fibre optic network is good the network is stable, robust and resilient although coverage is limited.
- The transmission electronics equipment placed at terminals in capital cities was designed/planned for voice and now is being used for streaming etc and it has no capacity to respond to the demand for high levels of data transmission.

It was concluded that the financial situation of TMCEL was moderate and the company was depending mostly on soft loans and possible grants from the Government and the donor community to satisfy the demands for telecommunications services. Organisationally TMCEL was considered to be strong and sustainable with competent management. Against this background BTN 3 was considered to be viable and sustainable with considerable economic benefits. However, current financial reports and performance give cause for concern in that it was expected that the project would be able to cover operation and maintenance costs and to pay back the loan from the revenue generated by usage of the project infrastructure. However,

during the field phase it was reported that whilst the fibre optic network is being used extensively, a constraint is that the major current users of the TMCEL telecoms system are government institutions which are failing to pay TMCEL services, resulting in debts and in turn TMCEL also owes substantial amounts to other companies. There is thus a very real threat to longer term economic viability

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>An Economic Analysis was undertaken which assessed economic benefits as ‘considerable’ noting that telecoms projects have a positive impact on socio-economic development by way of easing the life of local households, enhance access to information and knowledge and assist the expansion of business production and trade. This project being part of the total backbone project was expected to be a cornerstone of telecommunication services instrumental in reducing illiteracy and generating jobs throughout the country. Finally, GoM was expected to benefit financially from TMCEL’s ability to pay dividends and taxes – given the reported TMCEL cash-flow problems arising from non-payment for services these financial benefits to GoM are unlikely to be realised (at least to the extent expected). However, given the limited outcome indicators and lack of reporting the potential development benefits cannot be quantified (although there is no doubt that most are being generated to some extent).</p> <p>An Economic Analysis was undertaken which assessed economic benefits as ‘considerable’ noting that telecoms projects have a positive impact on socio-economic development by way of easing the life of local households, enhance access to information and knowledge and assist the expansion of business production and trade. This project being part of the total backbone project was expected to be a cornerstone of telecommunication services instrumental in reducing illiteracy and generating jobs throughout the country. Finally, GoM was expected to benefit financially from TMCEL’s ability to pay dividends and taxes. Despite projections that the project would be commercially viable and organisationally, technically and financially sustainable, given the field visit reports of TMCEL cash-flow problems arising from non-payment for services not only are these financial benefits to GoM unlikely to be realised (at least to the extent expected) but also O&M of the network may be prejudiced.</p> <p>JC Rating – Partly Satisfactory </p>	
JC 8.2 Level of commercial/financial viability of infrastructure	
<p>Financial viability was assessed as financially marginally viable and sustainable:</p> <p>The feasibility calculations prepared for Phase 3 showed that the investment would be profitable with a positive financial internal rate of return (FIRR) of about 8% and a new present value at 4% discount rate of USD 8 million (EUR 5,7 million). The main sources of income were expected to be from leased lines, regional connections and reduction in satellite costs. The cash flow was expected to be positive throughout the envisaged budget period subject to the Danish loan thus counter balancing the investment costs.</p> <p>The budgets were calculated in current prices and based on assumptions:</p> <ul style="list-style-type: none"> • Devaluation of the Metical to USD (and EUR) 10% per year • Average annual inflation rate 8% • Yearly reduction in number of employees (10% in the first years, thereafter decreasing percentages) • Average depreciation of fixed assets 6% per annum • Corporate tax rate 32% • Dividends 25% • Yearly investments and reinvestments 25% of annual turn over • Financing of yearly investments 50% from the company’s free cash flow and 50% borrowing <p>The budget period included the total pay-back period for the Danish Phase 1, 2 and 3 loans. Net TMCEL profit after tax was budgeted at EUR 2 million for 2009 increasing gradually over the envisaged period to EUR 8 million in 2014 and EUR 17 million in 2020. The company’s cash flow budget, including new investments and borrowings, was expected to be almost balanced. On average the company planned to use about EUR 11 million for investments per annum (half of this amount was assumed to be loans). The expected annual investment level was relatively low compared to the overall aim of TMCEL to meet coverage and service level demand but maintaining a balanced cash flow situation was regarded as a prerequisite by the company to sustain its credit worthiness.</p>	

Given the reported non-payment by government institutions for TMCEL fibre optic services and resultant cash flow issues, this financial plan is not being fulfilled to the extent foreseen

JC Rating - Partly satisfactory 

JC 8.3 Level of improvements in ESG achievement

No comparisons between ex-ante and ex-post ESG performance (other than as covered in Progress monitoring reports) have been examined although considering that negative environmental impacts arising from construction and operation are assessed as 'insignificant' this issue is not considered to be potentially serious. Environmental impacts during construction arose from excavation along road sides (and to a lesser extent rail lines and transmission lines) and were of a temporary nature.

Indirect benefits expected included a positive impact on socio-economic development contributing to social benefits, access to information and knowledge, expansion of business production and trade and support to E-government given that limited access to telecommunications services in the Central and Northern Provinces had been identified as a barrier for social and economic development in these provinces.

JC Rating –Satisfactory 

EQ 8 Overall Rating – Partly Satisfactory

An Economic Analysis was undertaken which assessed economic benefits as 'considerable' (the project was assessed as financially marginally viable and sustainable) noting that telecoms projects have a positive impact on socio-economic development by way of easing the life of local households, enhance access to information and knowledge and assist the expansion of business production and trade. However, direct employment was assessed as minor whilst on the other hand indirect employment and income generation was assumed to be significant. With affordable access to the internet business opportunities were expected to multiply whilst simultaneously access to technological and market information would support increased product development and quality. Easy and affordable access to telecommunication services may lead to increased property values whilst E-learning would give a boost to education all over the country, but particularly in the rural areas and E-medicine would assist in improving the general health conditions of the population. Finally, GoM was expected to benefit financially from TMCEL's ability to pay dividends and taxes but given the reported TMCEL cash-flow problems arising from non-payment for services these financial benefits to GoM are unlikely to be realised (at least to the extent expected). Given the limited outcome indicators and lack of reporting the potential development benefits cannot be quantified (although there is no doubt that most are being generated to some extent).

Given the reported non-payment by government institutions for TMCEL fibre optic services and resultant cash flow issues, this financial plan is not being fulfilled to the extent foreseen and thus under present circumstances the project must be considered socially and environmentally sustainable but not economically sustainable.

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
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JC 10.1 Quality of risk management systems and policies on long-term sustainability

Assumptions and Risks were identified for the project noting that BTN 3 was part of the whole backbone project and should not be considered as a stand-alone project. At the same time the future viability of the project owner, TMCEL, depends heavily on the income from wholesaling of the backbone services (which has been found to be in doubt due to non-payment by GoM institutions). For BTN 3 the main risk/assumptions were, as for previous phases, that the Danish turnkey supplier would be able to deliver according to the contract and that TMCEL would be able to manage the project implementation. The contract conditions secured good and manageable parameters for controlling the turnkey supplier and the time set for project implementation was reasonable. The supplier for BTN 3 was the same as for previous phases and the TMCEL implementation team had also not changed. Since the implementation of earlier phases had been largely without problems it was (correctly) concluded that implementation would not pose any great risk to delivery of outputs

The overall risk for the project is closely connected to the viability and sustainability of TMCEL. The fully liberalised telecommunication market in Mozambique has attracted competitors to the extent that TMCEL is not able to meet the demand of the consumers for access as well as pricing. The biggest weakness of TMCEL is that it cannot raise new share capital in the market as long as GoM has 100% ownership. Since GoM is not in a position to increase the capital base of TMCEL significantly the company depends on its own


relatively modest free cash flow and borrowing which has also be relatively modest due to the lenders' guarantee requirements. This situation means that it is very difficult for TMCEL to catch up with the increasing demand and other firms have taken the opportunity to fill the gaps (e.g. Vodacom establishing its own (wireless) backbone network). Since telecommunication tariff rates are regulated by INCM, with a mandate is to reduce the cost of telecommunication for businesses and the general public through maintaining a competitive market for telecommunication services, it was not an option of TMCEL to increase its profit through tariff increases. Thus it is concluded that whilst TMCEL has the technical capacity for O&M of the network, the financial constraints threaten the effectiveness of this operational capacity as well as the capacity of TMCEL to take advantage of market demands, thus potentially increasing opportunities for other operators.

JC Rating – Partly Satisfactory 


JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

Apart from specification of output and outcome indicators no subsequent reporting against these indicators has been scrutinised by the evaluation⁸⁷.

JC Rating – Partly satisfactory 

EQ 10 Overall Rating – Partly satisfactory 

BTN 3 project was part of the whole backbone project and should not be considered as a stand-alone project. Basically implementation risks were discounted on the basis of good experiences in implementing previous phases and this assessment of (low) risk was found to be correct. Longer term viability and sustainability risks were correctly linked to TMCEL financial situation which, in turn, is linked to constraints on TMCEL in accessing finance and setting of cost-recovery tariffs thus potentially permitting access to the market by other players (such as Vodaphone) but it was wrongly assumed that TMCEL cash flow would not be a risk – the non-payment for fibre optic services by GoM institutions is a serious issue affecting TMCEL financial plans and O&M of the network as a whole.. Although some output and outcome indicators have been specified no monitoring reports (other than the Verification Report) have been scrutinised by the evaluation [according to the Verification Report no such reporting on outcome indicators was actually carried out by TMCEL].

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
<p>The specified project monitoring indicators were identified as follows:</p> <p><u>Output Indicators</u></p> <ul style="list-style-type: none"> • Actual investment costs against contract amount • Actual project completion times against planned • Installed length of optical fibre cable and installed transmission electronics capacities against planned • Person days of training • CSR and gender policy formulated <p>The output indicators are reasonable for monitoring contract progress (albeit a little 'thin' and actual progress monitoring was reported to be more detailed).</p> <p><u>Outcome Indicators</u></p> <ul style="list-style-type: none"> • Increase in traffic from Phase 3 lines • Number of leased lines (2Mbits and 64Kbits) on Phase 3 lines • Number of regional 2Mbit lines for transit traffic <p>There is no specification of monitoring indicators for wider direct and indirect development outcomes or impacts, these outcome indicators relating only to technical use and performance of infrastructure delivered by the project.</p> <p>JC Rating – Partly satisfactory </p>	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>Apart from specification of output and outcome indicators no subsequent reporting against these indicators has been scrutinised by the evaluation (however, it has been reported to the evaluation that M&E and reporting frameworks consistently provided information for implementation management of progress of the project but not of the development objectives and results/outcomes/impacts of the DSIF investment and there is no reference to 'Lessons learned')..</p>	

⁸⁷ However, it has been reported to the evaluation that M&E and reporting frameworks consistently provided information for implementation management of progress of the project but not of the development objectives and results/outcomes/impacts of the DSIF investment and there is no reference to 'Lessons learned'

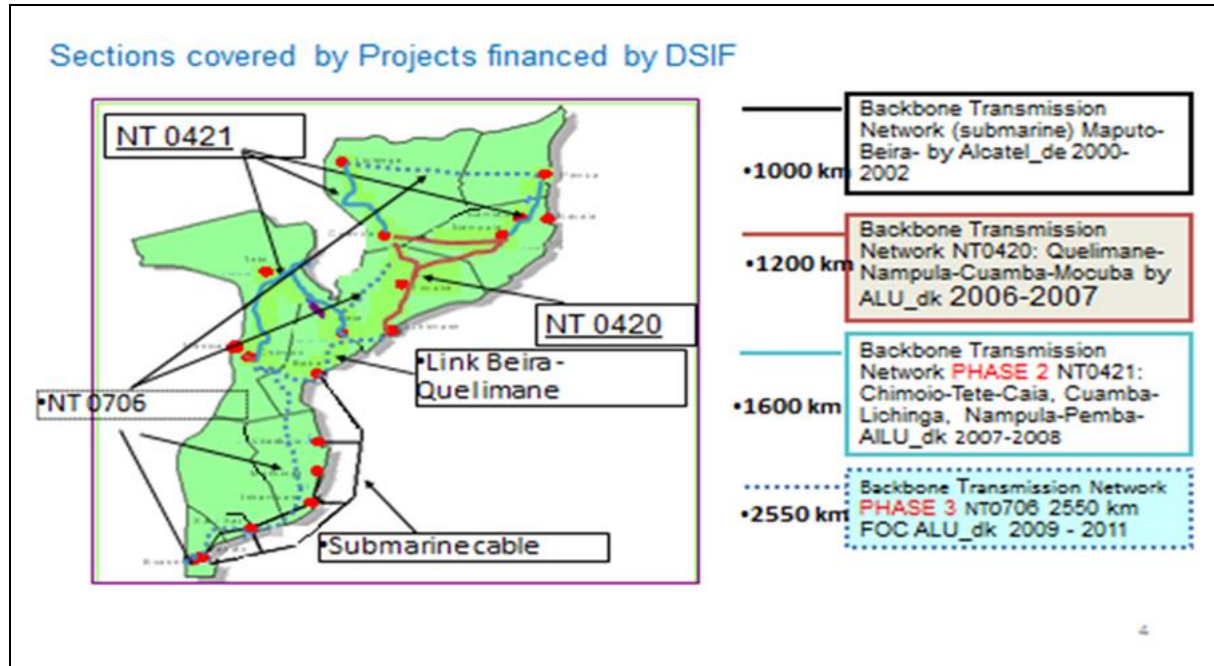
Although it was agreed that for the first five years after commissioning, the buyer will be responsible for providing data for use on the outcome indicators on an annual basis, no such ex-post reporting appears to have been supplied.

JC Rating – Unsatisfactory ●

EQ 11 Overall Rating – Partly satisfactory ●

No implementation progress reports have been scrutinised by the evaluation except for the 15/12/2013 Final Progress Report: Monitoring Implementation of Backbone Transmission Network Phase III (Verification Report) although project implementation monitoring reportedly consisted of regular, good quality monitoring of implementation progress activities (e.g. construction, training). The specified RMS in terms of outcome monitoring was of limited scope (i.e. only refers to usage and performance of the project infrastructure) and appears not to have actually been reported upon.

Field visits and calls



11.1.1 Introduction

The field mission took place from 23 March to 24 June 2021 in Maputo,

People met: Yunus Esmail (Board Adviser), Armando Mandomando (Board Adviser for the Technical Area), Candido Gobo (Board Adviser for the Technical Area), Moisés Nhabanga (Head of Technical Projects), Prof. Lourino Chemane (CEO INTIC and Former Executive Director for MoRENNet) - See annex 1 for the full list.

Institutions interviewed: TMCEL (Moçambique Telecom, SA), INTIC (Instituto Nacional de Tecnologias, Informação e Comunicação – *National Institute for Technology, Information and Communication*) / MoRENNet (Rede de Educação e Pesquisa de Moçambique – *Research Network for Education in Mozambique*).

During the field visits (undertaken by José Chiburre, facilitated by Paulino d’Uambo) meetings were held with TMCEL (Moçambique Telecom, SA), INTIC (Instituto Nacional de Tecnologias, Informação e Comunicação – *National Institute for Technology, Information and Communication*) / MoRENNet (Rede de Educação e Pesquisa de Moçambique – *Research Network for Education in Mozambique*) between 23rd March 2021 and 24th June 2021.

11.1.2 Findings

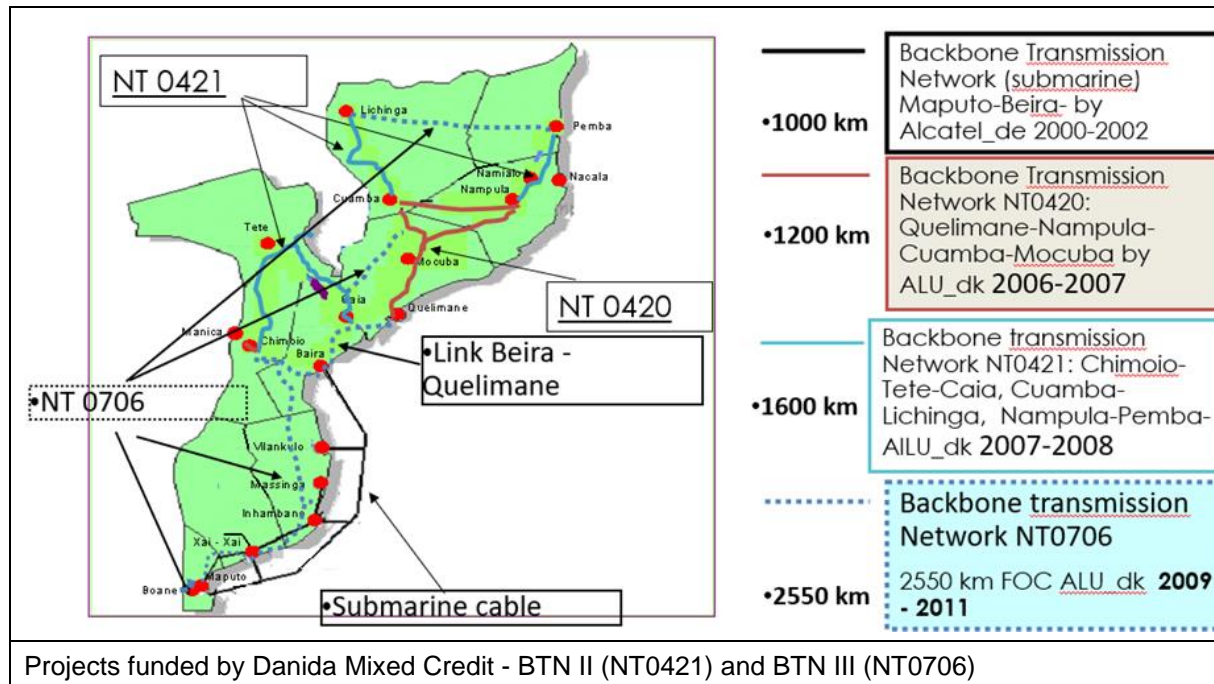
11.1.2.1 Working with Danida

The Report evaluates the implementation Backbone Transmission Network II (BTN II) and Backbone Transmission Network III (BTN III) projects funded by Danida Mixed Credit.

The BTN II was implemented between 2007 and 2009, connecting Cuamba-Lichinga, Nampula-Pemba, Tete-Chimoio, Tete-Caia, Tete-Zóbúè and Chimoio-Machipanda, with a total extension of about 1,600 km (see figure 1, connections indicated with the green line)

The Backbone Transmission II was successful, and that allowed the funding of the phase 3.

The BTN III was implemented between 2009 and 2011, connecting Maputo-XaiXai-Massinga-Inchope, Chimoio-Dondo, Mutarare-Gurue, Lichinga-Pemba, Boane-Goba, with a total extension of 2,550 km (see figure 1 below, connections indicated by the dotted green line).



The main objective of the project for TDM (TMCEL), being the only telecommunications' service provider in the country at the time, was to improve telecommunications services in the country through expansion of the national backbone network, establishment of fibre optical transmission redundancy to back up the fibre optic sea line and connect to inland countries such as Zimbabwe, Malawi, Swaziland, Zambia

The time the project was designed, TDM was 100% state owned company and it merged with MCell and TMCEL (now 90% State owned company) was created.

At the design of the project, TDM was the only telecommunications company in Mozambique (there were no competitors), and the decision to embark into this project was taken with the intention of providing fibre optic network coverage for all capital cities in Mozambique.

A subcontractor was contracted following national procedures for international tenders, and about 5 to 6 globally recognised telecommunication companies were invited to apply. One of the requisites for the selection of the subcontractor was that the bidders should present the financing solution. Out of the invited companies, Alcatel from Denmark presented a good proposal with attractive financing solution, and it was selected. This is how Danida came in.

The Danida financing proposal was unbeatable as it had subsidized conditions, including 5-year grace period and 10 years payback period. According to TMCEL management, Danida funding was not a commercial financing, instead the financing was meant to benefit the country.

TDM had worked with Alcatel France and Portugal before and they enjoyed a good relationship, and Alcatel Denmark / Danida / TDM was a perfect match as the work progressed smoothly, with technical assistance / knowledge transfer to TDM technicians, provision of adequate equipment including spare parts without delays. TDM also enjoyed good collaboration with Administração Nacional de Estradas – *National Road Network Administration (ANE)*, Electricidade de Moçambique – *Mozambique Electricity Company (EDM)*. All relevant parties played an important role in TDM project as they recognised the need for data transmission for their own activities as well.

The technological choice (underground fibre optic) was the best one. And according to TDM management, they would still choose the same if they were to implement the project today. TMCEL, Vodacom and neighbouring countries use TCM (TMCEL) the fibre optic and it is of recognised top quality (for lower speed)!

The projects had three components:

16. Mechanical excavation (except for some parts where mechanical excavation was not possible) along the road (1,5 meters from the road. About 70% of the project total cost was spent on excavation
17. Burying of the fibre optic

18. Installation of the equipment at the data centres (mainly in the capital cities)

A total of 4.184 km of fibre optic was placed along the roads (90%) and the railways (10%). The project was especially important, and without the project TMCEL would not exist today.

Before carrying out all the mechanical work, relevant studies such as Environmental Impact Assessment (EIA) and Environmental Management Plan (EMA) were conducted and approved by the Ministry for Coordination of Environmental Affairs (MICOA).

During the project implementation the structure included: **TDM**: Owner of the project and supervisor; **Alcatel**: Contracted Firm, managed by Hoolf Dan Pfaff; **Kund (from Danida)**: Monitoring project progress and report to Danida. There were regular coordination meetings between all the parties involved and because of the adequate coordination there were no pending issues nor there was a need for additional funding.

All the planned works were completed accordingly and on time, except for Phase 2 which observed a slight delay.

11.1.2.2 Relationship with Danida and Project Impact

Danida – Mixed Credit funding was the most successful national project for TDM (TMCEL), considering the size, the quality, good relationship with the partner / all the interested parties and the impact of the project. The project was implemented 10 years ago, and until now the network is still operational and functioning well (to its capacity).

Danida was open and cooperative, they did not reject anything from what was projected - they accepted everything, there was no limitation of funds and the whole process was so quick.

The projects (BTN II and BTN III) run very well and there were no issues during and even after the implementation of the project.

11.1.2.3 Competition and TMCEL upgrading Project

From 2014 TDM started to facing competition with mobile communication, first with Vodacom and later Movitel who (both) came into Mozambican market strong and with financial resources. Because of the competition, TDM merged with MCEL to be able to operate both land line and mobile communication.

Because TMCEL believe that they have the best backbone transmission infrastructure, TMCEL designed a new project to upgrade the transmission electronics equipment in the major townships and cities. The upgrade would be done in every 180km distance to ensure adequate and robust network coverage. It is believed that this project will take TMCEL back as the leader in provision of communications services.

For the above-mentioned project, the contract with the financier had been signed, but financing was halted after the issue of Mozambique debt came to public knowledge. According to Eng. Yunus, the World Bank recognised that Mozambique has one of the most modern communication infrastructures, referring to the backbone.

11.1.2.4 Major users (MoRENet and GovNet)

The major users of the fibre optic are MoRENet (Network for Universities / Institutes of Higher Education, Technical Colleges / Schools, Research Institutions) Gov.Net (Network for all government institutions – Ministries, public institutions, provincial directorates, Parque de Ciências e Tecnologias de Maluane – *Maluane Science and Technology Park*, etc). MoRENet which interconnects 180 institutions (additional 103 are in a process of being connected) and Gov.Net interconnecting 700 institutions are the biggest communication networks for the government of Mozambique and use the fibre optic circuits – depend on fibre optic.

According to the major users the capacity of the fibre optic is particularly good, and the network is stable, robust and resilient. However, the coverage is limited, and the quality of the network is only good where there is good coverage.

The transmission electronics equipment placed at the terminals in the capital cities was designed / planned for voice and now it is being used for videos, etc. and it has no capacity to respond to the demand on data.

During the design, the volume of data being transmitted now was not foreseen, hence the existing capacity cannot respond to the current demand on data. For example, in area such as Vilanculo and Chibuto where there are state owned Universities there is no fibre optic and the network is weak. In these areas MoRENet needs about 100MB/s in these areas for online meetings, conference calls, online lessons, etc. and it was supposed to get 100MB/s from two suppliers (one being the main and the other

one being backup), but MoRENet can only get 10MB/s from TMCEL, making MoRENet use Vodacom and Movitel networks as the main sources.

MoRENet is establishing additional 103 connection, but for 33 connection it is becoming difficult because the fibre optic coverage doesn't reach those 33 areas which are in the districts in the northern parts of the country.

While the fibre optic is being used extensively, the constrain is that the major user of TMCEL telecommunication system is the government through MoRENet and Gov.Net. These are government institutions are failing to pay their bills to TMCEL, resulting in huge debts. TMCEL is owed a lot of money by the institutions they provide services; and because of that TMCEL also owes substantial amount of money to other companies it relates with.

In the case of MoRENet, the government pay 60% of the total expenses incurred by MoRENet, and MoRENet covers the 40% through fees they received from the Universities who have subsidized tariffs.

11.1.3 Future Plans

Make sure the fibre optic reaches the client through establishment of a metropolitan network.

Upgrade the equipment to be able to provide better services to TMCEL clients, investing in both land and mobile communication.

TMCEL is operating at 3,5G. They recently upgraded to 4,0GB for Maputo and Matola Cities on pilot basis. TMCEL. TMCEL intends to upgrade to 4,0GB across the country.

11.1.4 Challenges

TMCEL doesn't have funds to upgrade the services required, and to get funding there is need to get clearance from the State / Government which reputation is not good at the moment.

Disadvantage of the fibre optic is that when there is a breakdown it takes time to fix because the cables are underground.

Access to technology and basic services such as banking depend on telecommunications; and the fact that the fibre optic doesn't cover the whole country it creates a social exclusion as part of the population, especially those living in rural areas, are denied access to information and other services possible with fibre optic.

11.1.5 Conclusions

The Projects (BTN II and BTN III) were well implemented, the cooperation between the parties involved, including Danida and the subcontractor, was fantastic and the project is having a great impact in the country. Without the Projects, TMCEL would not exist now!

The fibre optic is being used in all the country and in the connections with the inland countries. However, the transmission electronics equipment (purchased based on 2007 / 9 needs) doesn't respond to current demand in data. This results in TMCEL losing to its competitors.

TMCEL designed a project for the upgrade of the transmission equipment but could not access funds due to the country's debt situation.

12 Mozambique: Dredger Beira Port

Overview

Key issues, highlights and lessons learnt	
<p>After considerable delays in project preparation the dredger (Macuti) was handed over by the shipyard Western Batiya Shipyard at Klaipeda, Lithuania on 29/04/2013 and arrived at Beira in June 2013. Dredging was carried out in 2013, 2014, 2015 and 2016 before the dredger was in collision with a large vessel (operated by MSC – Mediterranean Shipping Company⁸⁸) in June 2016. The vessel was salvaged on 04/09/2016 to 05/10/2016 and was subsequently transferred to DORMAC in Durban after considerable discussion (and disagreement) between the various parties over the scope of repairs and location of such repairs. The insurance company and Danida have been party to these discussions but insurance liability issues were never resolved to the satisfaction of all parties and these disputes continue to 2021 with repairs now scheduled for completion in Q1/Q2 2021. Scope and Specification of repairs remain a cause of dispute.</p> <p>In 2015 it was observed that the dredger was only operating at 35-50% of capacity and EMODRAGA (Mozambique Dredging Company) requested Danida for additional operational training (not noting dissatisfaction with the effectiveness of previous training). Danida agreed in principle to additional training but before this programme could be launched, the vessel sank following the collision.</p> <p>The insurer (IMPARG) launched an international tender for repairs to which 9 shipping yards responded including the fabricator (Western Batiya Shipyard). IMPARG selected the lowest bid from DORMAC, Durban, RSA. The bid price and reparation period have been exceeded (due to additional complications) but the dredger is now scheduled to return to Beira in July 2021. Repairs have taken ~4.5 years (cf 2 years for fabrication). Prior to delivery detailed inspection is to be carried by NAVAR and an independent consultant (both were involved in the original design). A contribution to this delay was argument about the engines which has taken about a year to resolve⁸⁹. IMPARG has demanded cost sharing of repairs by EMODRAGA and such a payment has been made. Meanwhile IMPARG reportedly sued MSC for cost recovery and damages which are understood to have covered all the insurer's repair costs. EMODRAGA thus contends that no cost-sharing should be necessary. DSIF has maintained contact with EMODRAGA throughout this saga and has now engaged a specialist maritime legal firm (HAFNA Law Firm LLP), Denmark to open proceedings against IMPARG for recovery of monied paid by EMODRAGA to IMPARG.</p> <p>After the sinking of the Macuti, the Danish Embassy immediately urged that specialist technical assistance be offered to EMODRAGA to resolve insurance and liability issues and Danida have previously offered assistance in repairs (supervision, specifications, inspection, legal advice regarding insurance claim) but there has been little direct engagement until recently.</p> <p>Beira port requires regular dredging largely because of the large amounts of silt that the Pungue river deposits in the harbour. Emergency dredging of the access channel, quays and manoeuvring basins at the central Mozambican port of Beira, which began in 2017 ended in Q2 2018 at a cost of approximately €25 million (USD 30), the work being carried out by the Dutch company Van Oord, assisted by EMODRAGA. About three million cubic meters of sediment were removed over a six month period (including about 850.000 cubic meters of sand from the Sofala bank the Macuti curve and used as landfill for the new, multipurpose Quay 11). The aim of the dredging was to broaden the 27km long Beira access channel from 135 to 250 metres with a depth fixed at 8m for the straight stretches, and 9.2m the stretch known as the Macuti curve. This dredging will allow ships of up to 60.000 tonnes to enter the port at any time of day or night whereas previously only ships of up to 33.000 tonnes could dock at Beira. This should permit increased cargo to be handled by Beira, particularly to and from Zimbabwe, Zambia, Malawi and DRC. Following the completion of emergency dredging continuous maintenance dredging will be necessary. This is the second time in less than a decade that the port has undergone emergency dredging, the first being in 2010-2011 at a cost of €30 million (USD 40 million).</p> <p>The project was appraised in 2006 and based upon cargo handling figures for the period 2002 to 2005 and container handling (TEUs) was projected to rise from 46.775 (2005) to 159.000 by 2020. The recorded figure for 2019 was 259.938 (Instituto Nacional de Estatística).</p> <p>In this context the intended role of the Macuti may be seen to have been pivotal in maintaining the port fully operational. However, the dredger was only operational for about 3 years (and operating at <50% capacity) for that period but it is tentatively estimated that the expected positive economic viability will eventually be delivered in the years after the return to service of the dredger in mid-2021.</p>	


Summary	
Project name	Dredger – Beira Port
Type of project	Maritime
Project No.	104.O.30.Mozambique

⁸⁸ Reportedly under pilotage at the time of the collision

⁸⁹ Basically IMPARG contended that the engine damage was due to negligence on the part of EMODRAGA. This contention was finally disproved and all engine damage was attributed to the collision and sinking of the dredger.

Summary					
Description	Construction of a trailing suction hopper dredger(TSHD) of 3.900 dwt with about 2.500 m ³ hopper capacity and 3.750 tons soil capacity to improve and maintain the depth in the access channel to Beira; · Rehabilitation of two tug boats and one pilot boat; Survey equipment; Spares; PPM system; Technical assistance				
Sector	Ports				
Country	Mozambique				
Sponsor	EMODRAGA – Empresa Mozambicana de Dragagem				
Other stakeholders	CFM – Caminhos de Ferro, Mozambique Ministry of Finance Mozambique				
Clearance in principle					
Approval/Binding Commitment	20/11/2006	Loan / Investment Agreement Date			
Danish Bank	Danske Bank				
Loan Duration + Grace Period	10 years + 0 Grace period				
Project Amount and funding plan	Financial Data				
	Funder amount:	238,98	Mio. DKK		
	Loans: Amount:	200,68	Mio. DKK		
	Maturity:	10	Year		
	Grace:	-	Year		
	Total subsidy element:	50,33	% (OECD)		
	Total grant cost:	(Exchange rate DKK/USD 5,87)	Mio. DKK	Mio. USD	
	Total	147,05	25,05		
	Interest rate subsidy (CIRR+0,2 = 5,88):	57,52	9,80		
	EKF premium:	29,76	5,07		
	Bank margin:	1,92	0,33		
	Extra grant amount:	38,30	6,52		
	Provision for technical assistance:	6,00	1,02		
	Test run verification:	0,18	0,03		
	Budget margin 10%:	13,37	2,28		
	Project budget:	Total project investment	DKK	238,98	Mio.
	Dansk contract:	DKK	238,98	Mio.	
	Financing:			Fixed	
Danish Exporter	JV JGH/RN (Johs. Gram-Hanssen and Rohde Nielsen)				
MFA guarantee	Date		Amount	62%	Duration
Implementation status	Completed				
Feasibility study details	Appraisal of Improvements of Operation at Beira Port, Mozambique, January 2006 Jacobs Consultancy Ltd				
Subsidy – rationale and key features	50,3% DKK 147.050 million				
Country Context	The project was justified for Danish support on the grounds that the project was in accordance with Danida's overall development aim to reduce poverty by increasing regional development and economic growth in and around Beira as well as in the central region of Mozambique and in land locked countries of the interior of southern Africa through lower transport costs				

Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The Draft Appraisal Report (Royal Danish Ministry of Foreign Affairs – Danida: Appraisal of Improvements of Operation at Beira Port, Mozambique, January 2006, Jacobs Consultancy Ltd) made general reference to accordance with Danida’s overall development aims under 11. Justification for Danish Mixed Credits Support. The project was considered to be in accordance with Danida’s overall development aim to reduce poverty by supporting regional development and economic growth in the project area around Beira as well as in the hinterland region as a whole. The project was expected to contribute to the support of economic development as safer and more effective port access would lead to lower transport costs and stimulate increased trade through the port. Furthermore, employment would be generated both as part of the direct project implementation and also through additional services to be supplied in the port.</p> <p>Danida requirements concerning the environment included an approved environmental impact assessment and action plan for the appropriate categories. Several elements of the project were replacements for already existing operational equipment. Existing boats and the new dredger are expected to operate in line with international practice. The AM understood that a full strategic environmental and impact assessment of the disposal of dredged material would be undertaken as part of the Dutch backlog dredging contract. This would include the location of new dumping sites and the potential for coastal defence reclamation and consequent sanitation improvements in the low-lying city areas.</p> <p>The project was considered to be unlikely to be discriminatory between men and women and would be able to provide equal opportunities for improvements in living condition. The project was also considered to be neutral with regard to promotion of democratic and human rights. To the extent that it promoted and secured safer and more efficient movement of cargo through the country and region it encouraged regional co-operation as well as national cohesion.</p> <p>The project was generally in accordance with GoM’s overall development plans for the sector in Mozambique. The project as a whole was assessed as “non-financially viable” but economically viable.</p> <p>A loan under the Danish mixed credit facility required that a (turn-key) contract is signed with a Danish supplier. There was no requirement that the supplies have Danish origin.</p> <p>According to OECD rules a grant element of at least 50% of the loan would be required. Basically, the loan interest, which is paid by Danida, constitutes the grant element. It is a requirement of Danida that the loan subsidy benefits the end user.</p> <p>The dredger “Macuti” (a trailing suction hopper dredger (TSHD) with a capacity to hold 2,500 cum silt) was operated by the Danish consortium JGH/RN (Johs. Gram-Hanssen and Rohde Nielsen) on behalf of CFM and EMODRAGA. The dredging took place under a contract signed in January 2011) and a team of Mozambican technicians received training in the Netherlands in operating and maintaining the vessel. The ship was built at the Western Baltija shipyard in Klaipeda, Lithuania and on 29/04/2013 it was delivered to Johs. Gram-Hanssen whereupon the Macuti transferred to a port in Denmark before sailing to Mozambique, arriving Beira in June 2013. JC Rating -  Satisfactory</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders’ views into account	
<p>The draft Appraisal Report referred to national poverty reduction and development policies. <i>Mozambique has achieved a high level of economic growth in recent years but the country is still one of the most impoverished, with a GDP per capita in money terms of only US\$267 in 2004 (estimated as US\$1.400 at PPP). In recognition of this, the Mozambique government remains committed to continuing economic reforms and to implementing PARPA⁹⁰ (Action Plan for the Reduction of Absolute Poverty), the objectives of which are:</i></p> <ul style="list-style-type: none"> <i>To remove administrative barriers to investment;</i> <i>To create a favourable economic environment so as to attract more investment to the country, and</i> <i>To support economic development in order to reduce absolute poverty.</i> <p>Under ‘3.4 National Objectives and Aspirations’ reference was made to Beira port and support to national and regional development.</p> <p><i>The principal national objective is to make Beira port readily accessible and safe to use, supporting both national and regional development.</i></p> <p><i>To achieve this, CFM wishes to restore the Beira access channel to its original design depth and width and to improve the delivery of its marine services in the port. The proposed refurbishment of its port tugs and pilot boat and improvements to maintenance are designed to support this aim.</i></p> <p><i>As contract dredging is likely to be significantly more expensive than in-house capacity, EMODRAGA seeks to acquire sufficient dredging capacity and professional survey capability to ensure that it can assist CFM to meet its objectives. Its main proposal is to acquire a new, high-performance TSHD with a hopper capacity of 2.500 m³ and a deadweight capacity about 3.900 tons. This will replace the 43-year old “Rovuma”.</i></p>	

⁹⁰ Action Plan for the Reduction of Absolute Poverty 2006-2009 (PARPA II – Plano de Acção de Redução da Pobreza Absoluta) Final Version was approved by the Council of Ministers May 2, 2006

Stakeholder views were taken into account by the Appraisal with interviews having been carried out with shipping and forwarding agents and other stakeholders within Beira Port i.e. Mocargo, OACS, Manica, WFP, SDV/AMI Cornelder.

PARPA notes *'the importance of understanding the important element in the development of Mozambique is the role of cities such as Maputo, Beira and Nacala as ports for the export of products from, and as points of contact with the outside world for neighbouring countries'* going on to observe that Beira is in a *'less dynamic economic region, in both international and domestic terms'* and note that *'Beira was profoundly affected by the war'*. Otherwise PARPA notes the importance of better access to Beira by way of the Beira Corridor (especially by rail)

JC Rating -  Satisfactory

JC 1.3 Added value of Project Preparation Facility (PPF)

There was no use made of the PPF but the Appraisal Report did make recommendations on Danida support to project preparation i.e. that: the revised project was suitable for Mixed Credits support (with repayment period open to agreement between Danida and GoM); CFM appoints a well-qualified Project Manager to cover all aspects relating to both CFM and EMODRAGA; Danida provides TA for tender preparation, evaluation and supervision and for the introduction of the new dredger and the new systems planned for maintenance and engineering. Conditionalties were also proposed: formal approval from the Board of CFM and endorsed by the relevant Ministries in Mozambique; CFM/EMODRAGA carry out an EIA for the project in accordance with Mozambique for Danida approval in advance of floating any tender for works; the Dredging Fund (or a suitable alternative based on user pays principles), is duly established with sufficient funds to ensure the operation of the required dredging and the repayment of the loans for all dredging needs; tender evaluation, commercial and training contracts subject to Danida approval.

Another significant document presented for DSIF consideration was the Final Report, Simplified Environmental Study of the Dredging of Beira Port Access Channel (Prepared for: Direcção De Engenharia dos Portos e Caminhos De Ferro De Moçambique, EP) Consultec, January 2007

JC Rating - N/A

JC 1.4 Complementarity with development partners operations and strategies

In the late 1980's and early 1990's the international donor community supported an extensive refurbishment of the Beira Corridor infrastructure. Danida provided the two tug boats "Buzi" and "Pungue", two small pilot boats, a larger pilot boat, the "Piloto 2", two line boats and a new jetty for the port service vessels. Danida further supported the construction of a port services building. In addition, Danida provided spare parts support and financing of a 6-year programme of Technical Assistance, which terminated in 1995.

Other donors facilitated the construction of a new container terminal for vessels up to 30.000 dwt and a new oil terminal designed to accommodate oil tankers of 50.000 dwt. With a view to ensuring safe access for such ships, the Dutch government supported capital dredging of the Beira access channel. However, the channel was not dredged fully and silted up. The depth in some parts of the channel was reduced to about 4 m below CDL and in some critical areas the width was only 100 m. This was later followed by Norwegian support for construction of a new oil terminal designed to accommodate oil tankers of 50.000 tons

Over the next 13 years the channel was not dredged fully and has silted up. Over this period CFM was in negotiation for an additional dredger with EU funding but the project was not implemented. A small capacity dredger was provided in 2000 through assistance from Japan following a major feasibility study of needs, sedimentation and environmental impacts carried out by Japanese consultants in 1996/97. The Japanese government agreed in May 2005 to provide a sister vessel, also on grant basis, for delivery in mid-2007. The Dutch Government indicated willingness to provide concessionary finance for the re-dredging of the access channel into Beira which has a length of about 28 km from the sea to Beira Port. The channel is L-shaped with an 80° bend around the Macuti Shoal, some 12 km from the port. The work was expected to be to the original channel design specification and in the same location. This backlog dredging of the access channel was planned before the end of 2006.

Danida requirements concerning the environment include an approved environmental impact assessment and action plan for the appropriate categories. A full strategic environmental and impact assessment of the disposal of dredged material was undertaken as part of the Dutch backlog dredging contract (including the location of new dumping sites and the potential for coastal defence reclamation and consequent sanitation improvements in the low lying city areas). The issues of impacts of dredging activities, ship's operations and occupational health and safety were addressed in some detail in the JICA study in the late 1990's covering such issues as water quality, coastal erosion (Macuti Beach), marine life and fishing. The JICA study carried out extensive investigations and tests over a prolonged period covering both a wet and a dry season. There was clear interface between the Dutch, Danish and JICA projects at this point⁹¹.

JC Rating -  Satisfactory

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

⁹¹ Dutch support to the city of Beira goes back many years and has included development of the Beira Masterplan 2035 (2014), post-cyclone reconstruction, potable water supply and coastal protection

In the Appraisal Report, most references are made to environmental rather than development impact. However, in 'Analysis of Technical Solutions' it was concluded that the economic and social impacts of the project were positive and that the major issues were considered to be: the probability of substantial downgrading of Beira Port with consequential impacts on the supporting Beira corridor road and rail infrastructure to adjoining landlocked countries which rely upon the port and impacts on the Beira economy and the emerging economic investments here.

The project was considered to be in accordance with Danida's overall development aim to reduce poverty by supporting regional development and economic growth in the project area around Beira as well as in the hinterland region as a whole and that the project would contribute to economic development as safer and more effective port access would contribute to lower transport costs condition. The project was also considered to be neutral with regard to promotion of democratic and human rights.

The project is generally in accordance with GoM's overall development plans for the sector in Mozambique and as a whole was estimated to be "non-financially viable" and 'economically viable'.

Provided that the conditions for support were fulfilled, the project was considered to be institutionally technically and financially sustainable, thus potentially stimulating increased movements through the port. Furthermore, employment would be generated both as part of the direct project implementation and also through additional services supplied in the port.

Danida requirements concerning the environment included an approved environmental impact assessment and action plan for the appropriate categories. Several elements of the project were replacements for already existing operational equipment. Existing boats and the new dredger were expected to operate in line with international practice. The project was considered unlikely to be discriminatory between men and women and should provide equal opportunities for improvements in living.

Project selection criteria to identify projects with higher development outcomes/impacts were appropriate

JC Rating -  Satisfactory

EQ 1 Overall Rating – Satisfactory

The project was in accordance with Danida's overall development aim to reduce poverty by supporting regional development and economic growth in the project area around Beira as well as in the hinterland region as a whole. The project was expected to contribute to the support of economic development as safer and more effective port access would lead to lower transport costs, stimulate increased trade through the port and contribute towards employment generation.

Similarly reference to alignment with national development policies and strategies notes government commitments to economic reforms in implementation of PARPA (Plano de Acção para Redução de Pobreza Absoluta) including the role of Beira in national development as a ports for the export of products from, and as points of contact with the outside world for neighbouring. Otherwise PARPA notes the importance of better access to Beira by way of the Beira Corridor (especially by rail).

There was no reference as such to PPF but the Appraisal Report did make recommendations on Danida support to project preparation (provision of TA for tender preparation, evaluation and supervision and for the introduction of the new dredger and the new systems planned for maintenance and engineering) together with suggested conditionalities

There is reference to complementarity of Danish and Dutch support to Beira going back to the late 1980's and early 1990's (extensive refurbishment of the Beira Corridor infrastructure, Danida provision of tug boats and pilot and line boats and a new jetty for the port service vessels with a 6-year programme of TA which terminated in 1995. Other donors facilitated the construction of a new container terminal and a new oil terminal. With a view to ensuring safe access for such ships, the Dutch government supported capital dredging of the Beira access channel. Over the next 13 years the channel was not dredged fully and has silted up during which period CFM was in negotiation for an additional dredger with EU funding but the project was not implemented. A small capacity dredger was provided in 2000 through assistance from Japan following a major feasibility study of needs, sedimentation and environmental impacts carried out by Japanese consultants in 1996/97. The Japanese government agreed in May 2005 to provide a sister vessel, also on grant basis, for delivery in mid-2007. The Dutch Government financed the re-dredging of the access channel. This backlog dredging of the access channel was planned before the end of 2006.

Danida requirements concerning the environment include an approved environmental impact assessment and action plan. A full strategic environmental and impact assessment of the disposal of dredged material was undertaken as part of the Dutch backlog dredging contract). The issues of impacts of dredging activities, ship's operations and occupational health and safety were also addressed in the JICA study in the late. There was clear interface between the Dutch, Danish and JICA projects.

Provided that the conditions for support were fulfilled, the project was considered to be institutionally, technically and financially sustainable and thus project selection criteria to identify projects with higher development outcomes/impacts were appropriate.

EQ 2 -Coherence


To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?

JC 2.1 Systematic research for coherence with MFA development policies and strategy

The project was considered to be in accordance with Danida's overall development aim to reduce poverty by supporting regional development and economic growth in the project area around Beira as well as in the hinterland region as a whole by contribution to economic development (as safer and more effective port access would lead to lower transport costs and stimulate increased trade through the port). Furthermore, employment would be generated both as part of the direct project implementation and also through additional services to be supplied in the port. Danida requirements concerning the environment included an approved environmental impact assessment and action plan for the appropriate categories.. To the extent that it promoted and secured safer and more efficient movement of cargo through the country and region it encouraged regional co-operation as well as national cohesion. However, there appears to be limited coherence with then extant country strategy focal sectors (see JC 2.2 below).

The project as a whole was assessed as expected to be "non-financially viable" but, while it was expected to be economically viable and subject to fulfilment of conditionalities the project was considered to be institutionally, technically and financially sustainable and thus eligible for Danish mixed credit. A loan under the Danish mixed credit facility required that a (turn-key) contract was signed with a Danish supplier (JV JGH/RN (Johs. Gram-Hanssen and Rohde Nielsen) and there was no requirement that the supplies have Danish origin.

The Draft Strategy Concept Note 2006 (F289 for the Programme Committee) identified three funding sectors (Agriculture, Environment and Health) with explicit phasing out of the Education and Energy sectors⁹². There appears to be little obvious alignment between this project and Danida strategies for Mozambique as regards focal sectors.


JC Rating - Partly Satisfactory  - while in overall developmental terms a suitable project it was outside the scope of the three focus sectors.

JC 2.2 Synergies /complementarity with other Danish development initiatives

Strategy documents, of which only some are country strategies were published in 1988, 1995, 2000 and 2012. From 2000, the focus was on strengthening the state administration and extending public service delivery in sectors with Danish aid. This included direct cooperation with international and national CSOs and private sector actors. The water and fisheries sectors were phased out in the 2000-2004 strategy, giving priority to agriculture, energy, education and public sector reform. From 2003, Danish bilateral cooperation was decentralised to the Danish embassies, which means that the RDE steered most of the priorities in the country programme from then. As already stated, there was no new Danish country strategy for Mozambique developed between 2005 and 2012 and the Mozambique country programme was then, according to the Annual country Assessments from the RDE, still guided by the 2000/2004 strategy as well as the aid effectiveness agenda aligning assistance to the PARPA I and II and PARPA⁹³. The Draft Strategy Concept Note 2006 (F289 for the Programme Committee) identified three funding sectors (Agriculture, Environment and Health) with explicit phasing out of the Education and Energy sectors⁹⁴. Key Danida policies were the strategic review, 'A World of Difference', Paris Declaration and more decentralisation to RDE. There appears to be little obvious alignment between this project and Danida strategies for Mozambique as regards focal sectors.

As regards coordination the 2006-2016 period was characterised by less focus on project support and special programme grants and an increased focus on a sector wide approach (SWA), donor coordination, joint funding mechanisms and general budget support. It is therefore in general difficult to assess specific Danish attributions, although as a mid-sized donor Denmark has contributed to the positive progress in the regions and the sectors that were the focus of Danish support. Denmark was a strong advocate for and committed to donor coordination and alignment with government programmes and national systems. Alignment has been very important in increasing ownership and addressing national needs as they arose. In this sense, the coherent implementation in Mozambique of the Aid Effectiveness agenda played its intended role.

Although the project represented a continuation of earlier Danish support to Beira port (and to the rehabilitation of the Beira corridor road links) there was little alignment with then extant focal support sectors. However, there was clear cohesion and complementarity between Danish, Dutch and Japanese support to the port.

JC Rating -  Partly Satisfactory given only limited synergies /complementarity with other Danish development initiatives

JC 2.3 Danish business links with beneficiary countries

The potential for Danish content was estimated at feasibility stage and revised at appraisal. The estimated Danish content was ~57% (of estimated total costs of USD 36,84 million). In addition, specific training for all equipment including operation of the new dredger as well as TA for tender preparation, evaluation and supervision plus a start-up period to ensure transition to new systems is managed effectively over the warranty period.


At appraisal stage it was noted that: *'there could be several Danish suppliers interested in undertaking construction, refurbishment and supply and installation of the required equipment. They might wish to sub-contract with a local/regional contractor for some of the refurbishment works allowing responsibility for the entire supply contract to remain with the Danish supplier'* The loan under the Danish mixed credit facility required that a (turn-key) contract was signed with a Danish supplier (JV JGH/RN (Johs. Gram-Hanssen and


⁹² It should be noted that reference to 'phasing out' of sectors refers to Danish grant-funded support

⁹³ Source: Evaluation of Danish Engagement in Mozambique 1992/2016).


⁹⁴ It should be noted that reference to 'phasing out' of sectors refers to Danish grant-funded support

Rohde Nielsen) and there was no requirement that the supplies have Danish origin (the dredger was constructed in Lithuania).

JC Rating -  Partially Satisfactory as the dredger was built in Lithuania despite there being Danish shipyards that could have built it.

EQ 2 Overall Rating – Partially Satisfactory 

No new Danish strategy for Mozambique was developed between 2005 and 2012 and thus the Danida country programme at the time of preparation of this project was guided by the preceding 2000-2004 country strategy which responded to PARPA 1 & 2. Given that a draft 2006 concept note for Danida support for Mozambique identified 3 funding sectors (Agriculture, Environment, Health) and although the project represented a continuation of earlier Danish support to Beira port (and to the rehabilitation of the Beira corridor) there was little obvious complementarity or cohesion between this project and then extant focal sectors. However, there was clear cohesion and complementarity between Danish, Dutch and Japanese support to the port. That being said the project was considered to be in accordance with Danida's overall development aim to reduce poverty by supporting regional development and economic growth in the project area around Beira as well as in the hinterland region as a whole by contribution to economic development (as safer and more effective port access would lead to lower transport costs and stimulate increased trade through the port). The estimated Danish content was 57%. The contract was signed with Danish supplier (JV JGH/RN (Johs. Gram-Hanssen and Rohde Nielsen) although the vessel was built in Lithuania and not at a Danish shipyard (there was no requirement that supplies have to be of Danish origin).

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>The project, considered as a whole, was considered as non-financially/commercially viable in that the projected net cash-flow would not be sufficient to repay a commercial loan over a period of 10 years and consequently financial assistance from CFM and/or the GoM would be required. This could be channelled through the proposed Dredging Fund or through local dredging charges reflecting the high costs of keeping access open. DSIF's financial additionality was principally in the form of concessional funding and grants, which were important given the negative financial rate of return that was demonstrated by the financial analysis that was included in the appraisal study. No commercial or development bank funding was involved.</p> <p>JC Rating –  Satisfactory</p>	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
<p>There is strong evidence of DSIF non-financial additionality.</p> <ul style="list-style-type: none"> • DSIF provided technical assistance (to be contracted to a Danish firm following competitive tendering in Denmark) for tender preparation, evaluation, implementation and supervision (to be carried out under a separate contract with a Danish firm, appointed jointly by CFM, EMODRAGA and Danida after competitive tendering). This was a significant project for CFM and EMODRAGA who indicated that they would welcome such assistance. • Specific training for all the equipment installed was provided within the scope of the procurement including training of EMODRAGA staff (Captain, Chief Engineer and other relevant officers) in Holland for familiarisation with the new dredger and equipment. The selected officers were then expected to participate in the delivery voyage to Mozambique. • The scope of any post-delivery technical assistance was reviewed together with EMODRAGA who had demonstrated capability in operation of the sophisticated Japanese dredger and had plans for recruitment and training of additional crews for new dredgers. Rather than TA to manage and operate the new dredger on a long term basis it was considered that TA should be directed at the start-up period to ensure that the transition to new systems is managed effectively over the warranty period and for subsequent monitoring visits to confirm progress. Thus, TA and training was provided for the introduction of the new dredger and the new systems planned for maintenance and engineering (to assist in introduction of the new high-powered dredger and its higher specification including booster pump; and of hydrographic survey equipment). This required approximately 68 person months of input mainly in training in dredger operations (including support to the dredge-master, on-board-dredger engineer, hydrographic surveyor, shore-based engineering manager, electronics/electrical and hydraulics engineer). • In 2015 additional TA/training was requested by EMODRAGA as the dredger was only operating at 35-50% of planned capacity. This further Danish TA was seen as 'bridging' to a better functioning TA set-up including establishment of a PPP. At this time EMODRAGA proposed this establishment of a PPP between EMODRAGA and an international private dredging company (which would cover operations of 'Macuti' and the 2 smaller dredgers (JICA). Subject to feasibility studies of operations, cost structure, fees and incentive systems an international tender was proposed to be carried out. Danish and Japanese 'no objection' would be required together with GoM approval. Danish support and preliminary approval was granted and an offer of Danish assistance in preparation of ToR and tender documents was declined by EMODRAGA. • Strong DSIF non-financial additionality has also (eventually) accrued from the DSIF stance following the sinking of 'Macuti'. After the sinking of the Macuti, the Danish Embassy immediately urged that specialist 	

technical assistance be offered to EMODRAGA to resolve insurance and liability issues but DSIF offers of assistance in dealings with the insurance company and issues arising from the insurance claim and disputed repairs and liabilities for payment of repair costs were initially declined by EMODRAGA. More recently (with changes in senior management) EMODRAGA has taken up the long-standing DSIF offer of support (in this case regarding legal advice on the claims). DSIF has gone the extra mile in this continuing support.

The field visit in April 2021 found that DSIF additionality as perceived by EMODRAG/CFM was:

Strengths

- Strong presence and know-how
- Serious and committed
- 'Passionate' about Mozambique
- Offered assistance immediately after the sinking of 'Macuti' (but such assistance was not taken up at that time)
- Going the 'extra mile' to continue offer of assistance (which has more recently been taken up)
- Very good to work with – impartial, professional

Weakness

- Suspension of direct support to Mozambique (because Mozambican institutions have benefitted from Danish support and know-how)

JC Rating - Satisfactory

JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding

No commercial or development bank funding sources

JC Rating – N/A

EQ 5 Overall Rating – Satisfactory


DSIF's financial additionality was principally in the form of concessional funding and grants, which were important given the negative financial rate of return that was demonstrated by the financial analysis that was included in the appraisal study. No commercial or development bank funding was involved. Non-financial additionality was expected to result from operational training and TA including preparation of tender documents, procurement support and tender evaluation, implementation and supervision of construction of the dredger. Post completion, strong DSIF additionality has accrued from the DSIF stance following the sinking of 'Macuti'. After the sinking of the Macuti, the Danish Embassy immediately urged that specialist technical assistance be offered to EMODRAGA to resolve insurance and liability issues but DSIF offers of assistance in dealings with the insurance company and issues arising from the insurance claim and disputed repairs and liabilities for payment of repair costs were initially declined by EMODRAGA. More recently (with changes in senior management) EMODRAGA has taken up the long-standing DSIF offer of support (in this case regarding legal advice on the claims). DSIF has gone the extra mile in this continuing support.

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
The Verification Report (FS-Counsell, Finn Søholt) confirmed that the "Delivery and Acceptance Protocol" was signed 28th April 2013, and the ship was left Klaipeda the following day. It was confirmed that the dredger was delivered as per the 'Bimco Newbuilding contract' and in accordance with the specification. A detailed delivery and acceptance protocol according to contract no: 04/DENGA/CFM/2009 was prepared by OSK-Ship Tech A/S.	
JC Rating - Satisfactory	
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
<p>The project was expected to contribute to the support of economic development as safer and more effective port access would lead to lower transport costs and stimulates increased trade through the port. Furthermore, employment would be generated both as part of the direct project implementation and also through additional services to be supplied in the port.</p> <p>The efficiency of port handling operations has a direct impact upon transport of goods along the Beira Corridor (road and rail links) with national and international ramifications. Dredging is a major issue for Beira port which is not a natural deep-water port (as is Nacala further north in Mozambique). Constant silting and shifting underwater sandbanks require regular dredging, hampering efforts to build the Indian Ocean port into a major export hub. Beira has long been used as a transshipment port, processing cargo from landlocked Zimbabwe, Malawi and Zambia, but recently had also started moving coal found in Mozambique's northern Tete province, which links with Beira via an old railway. The Pungwe and Buzi rivers come together at the country's second biggest city and their currents build heavy siltation and sandbanks around the channel, making it difficult for large vessels to pass. A capital dredging project - normally used to deepen a port - was completed in 2011, but was not sufficient to allow Panamax vessels through and thus only ships of up to 9.5 meters could dock at Beira. The port was also constrained by limited capacity on the railway lines linking to Beira, with huge tonnages of cargo currently arriving by trucks along the Beira Corridor highway prone to flooding during the rains. From the region, Beira was traditionally used to export products such as tobacco, grains and cotton and to import food, fuel and fertiliser, but is increasingly moving minerals as well, including copper, iron ore, manganese and ferrochrome. Cornelder was contracted by CFM in 1998 to manage the port, with plans to</p>	

spend at least 300 million euros (\$400,51 million) to boost productivity and throughput via an additional quay, a new fertiliser terminal, upgrades to roads at port and equipment. Container traffic was expected to more than double between 2010 and 2015, while general cargo volumes, which include coal, were forecast to rise nearly sevenfold during that same period.

After considerable delays in project preparation⁹⁵, the dredger (Macuti) was handed over by the shipyard Western Batiya Shipyard at Klaipeda, Lithuania on 29/04/2013 and arrived at Beira in June 2013. Dredging was carried out in 2013, 2014, 2015 and 2016 before the dredger was in collision with a large vessel (operated by MSC – Mediterranean Shipping Company) in June 2016. In 2015 it was reported that the dredger was only operating at 35-50% of capacity and EMODRAGA requested Danida for additional operational training (not noting dis-satisfaction with the effectiveness of previous training). Danida agreed in principle to additional training but before this programme could be launched, the vessel sank following the collision.

The project was appraised in 2006 and based upon cargo handling figures for the period 2002 to 2005 and container handling (TEUs) was projected to rise from 46.775 (2005) to 159.000 by 2020. The recorded figure for 2019 was 259.938 (Instituto Nacional de Estadística). In this context the intended role of the Macuti may be seen to have been pivotal in maintaining the port fully operational. However, the dredger was only operational for about 3 years (and operating at <50% capacity) for that period.

JC Rating -  Partly satisfactory since the dredger was only operating for three years (2013 to 2016) before it sunk and only at 35% to 50% of capacity.

JC 6.3 Environmental, social and governance (ESG) risk management

A JICA study in the late 1990's carried out extensive environmental investigations and tests over a prolonged period covering both a wet and a dry season. A summary of their findings is summarised below:

The impact of dredging activities

Water Quality

Apart from significant faecal contamination stemming from outflow of sewage from Beira town. JICA found the water quality in the area to be within acceptable limits on all parameters. Testing of water samples revealed only minor concentrations of chemicals, and the salinity contents found in trace metals (mercury, cadmium, lead, arsenic, copper and zinc) suggest that the metals are brought down from the Pungue River catchment area and probably are of geological origin.

The high tidal range and the seasonal influx of massive quantities of fresh water, principally from the Pungue River, were found to play the dominant role in forming the marine environment. Simulation models carried out by the JICA study showed that diffusion of suspended solids caused by dredging was negligible.

Coastal Erosion – Macuti Beach

According to the JICA study there is a natural sand drift along the Macuti Coast in a south-westerly direction towards Beira Port. In the past, the sand drift transported from the mouth of the Zambezi River (north of Beira) compensated for the sand going out from the Macuti Coast, but the sediment drift from the Zambezi River has since decreased, supposedly due to upstream dam construction. This has resulted in erosion of the entire coast line south of the Zambezi and was deemed the main factor for the erosion experienced along the Macuti Coast. The effects of dredging activities in the access channel were found to be negligible and, if anything positive, because some of the dumped soil is brought back onto the Macuti Coast by wave action, which is predominantly from easterly and south-easterly directions.

Moreover, apart from dumping of soil through the bottom doors, the new dredger will be able to discharge and deliver sand over the bow for beach nourishment. The dredger will likewise be capable of pumping sand ashore through a pipeline, for instance for land reclamation works or for accumulation of sand for sale as building materials.

Marine Life and Fishing

The seabed materials in the port and estuarine area consist of mud and sandy sediment, and the JICA study found the macro-benthic fauna to be generally poor in the area. The turbidity is generally high and the salinity varies considerably due to the tidal effect. These conditions are generally not attractive to migratory and pelagic fish species, while other marine animals like crustaceans and shellfish can live in low saline water with high turbidity. These species are therefore predominant in the area, and the extra turbidity generated by dredging works were expected to have a negligible effect.

Impact of Ship's operations

Operation of the intended new dredger is expected to have negligible effects on the environment. The vessel will be constructed in compliance with all relevant international maritime conventions; notably the International Convention for the Prevention of Pollution from Ships, as adopted by the International Maritime Organisation (IMO). This lays down, for example, that exhaust emissions to the atmosphere will comply with international rules, that measures are taken to avoid spillage of oil over board during bunkering operations, that sewage and oily bilge water will be treated in separators and contained in separate tanks until delivery of residue can take place to approved reception facilities ashore, and that dry waste and garbage from kitchen and crew cabins etc will be contained under hygienic conditions until it can be disposed of ashore.

Occupational Health and Safety

The vessel would be equipped with life-saving appliances and fire-fighting systems in conformance with IMO's Safety of Life at Sea (SOLAS) Convention. Noise and vibration levels affecting crew welfare would comply with

⁹⁵ Reportedly due to the world financial crisis and major price variations

international standards, and measures be taken to minimise crew exposure to heavy lifts, hazardous substances and awkward working positions.

At appraisal stage the need for a strategic environmental assessment (SAE) was flagged and this study was specified as conditionality for Danida financing. CFM were expected to ensure that a full strategic environmental assessment (SAE) followed by a specific environmental impact assessment (EIA) was undertaken in conformity with established Mozambique guidelines for the backlog and maintenance dredging, and the refurbishment, construction and operation of ships (operation of ships to be in conformity with recognised safe working practices and IMO standards). Danida approval would be subject to a duly approved environmental management plan.

Thus, to initiate the process of the environmental impact assessment, at the end of April 2006, CFM submitted information to the National Office of Environmental Impact Assessment (DNAIA) regarding the *Process of Environmental Impact Assessment of the Dredging of the Access Channel to the Port of Beira Project*. With this document as reference, DNAIA classified the project as being of Category B requiring the submission of a Simplified Environmental Study (SES), after the approval of the respective Terms of Reference. The Terms of Reference were submitted by CFM in June 2006 having been approved by the Sofala DPCA (Provincial Office for Environmental Coordination) in June 2006.

In October 2006, CFM contracted CONSULTEC – Consultores Associados Lda to conduct the Simplified Environmental Study of the Dredging of the Access Channel of the Port of Beira (Final Report January 2007).

This SES contains, apart from a Non-Technical Summary, a Main Report integrating the following aspects:

- Description of the project and its location
- Legal framework
- Environmental diagnostic, with a brief description of the environmental status
- Identification and Assessment of Impacts and Mitigation Measures
- Environmental Management Plan with monitoring of the predicted impacts, necessary programmes and contingency plans for accidents

During the elaboration of the Environmental Diagnostic, project stakeholders were consulted, namely local fisherman, Beira Municipality and port users

The conclusions of this EIA were that the Port of Beira Access Channel Emergency Dredging would, in general, have a significant positive impact on Port activities and for the population of Beira as it would allow improved (and faster) access for maritime traffic which will progressively stimulate port activities, contributing to an increase economic activity in the medium to long term for the city, the Province and for the country's entire central region and that the impacts on the biophysical environment could be mitigated through the implementation of mitigation measures contained in the Environmental Management Plan..

Some potential negative impacts were identified, namely those related to coastal erosion, aquatic fauna, and negative consequences to artisanal fishing although these were not considered significant. The Simplified Environmental Study included measures to minimise these negative impacts, including recommendations relating to the disposal of dredge materials and additional measures to reduce the susceptibility of coastal erosion, also recommending the conducting of analyses to determine the quality of sediments as well as the monitoring of water quality around the port.

Positive conclusions included:

- dredged materials could possibly be used in Beira for; civil construction, landfill of swamplands, or the refilling of sand on the beaches. Utilisation of these dredge materials to fill swamplands would contribute to improvement of health conditions, reducing the rates of illnesses related to water, whilst also creating spaces for the expansion of the city.
- according with the conclusions reached by JICA (1998) and based on hydrodynamic models at that time developed, the deepening of the Access Channel would not cause any significant alterations to the levels of erosion currently being experienced.
- Sofala Bay already had high turbidity levels and was continually subject to maintenance dredging thus reducing the risk of potential ecological impacts. Furthermore, the available information about the sediment quality in Beira indicated that they are not contaminated, and this reduces the risk of marine organisms being affected.

Overall it is considered that ESG risk management has been comprehensively covered in project design

JC Rating - Satisfactory

JC 6.4 Contribution to climate change mitigation, green and inclusive development

There is no reference to greenhouse gas savings or climate change effects in the Appraisal Report or EIAS.

Some impacts on social-economic activities were identified in the EIAS:

Predicted potential impacts on socio-economic activities were in the most part positive, such as:

- Effects on fishing (albeit a localised risk to prawns and clams in Sofala Bay area under certain conditions)
- Effects in the rehabilitation of city structures
- Effects on port activity – in essence that the project would improve efficiency of port operations and that such a result would lead to more efficient, 'greener' port management of throughput and handling.

Interestingly the EIAS noted with considerable prescience that the presence of dredging vessels could cause disturbances by interfering with the movement of other vessels and the access traffic to the Portconsidering that this impact would be temporary, localised and applicable only to large vessels that have difficulties in


changing direction quickly and that this impact could be mitigated with a good communication system between the Port of Beira, ships in transit, and the dredging company.

JC Rating -  Partially Satisfactory

JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

As the project predated the Helsinki Principles' by 13 years, there was no explicit consideration of low carbon and climate resilience growth. Whilst the operation of the dredger has limited carbon and climate change implications it may be argued that efficient dredging of Beira port would enable greater throughput of goods (import and export) plus coal exports from Moatize. Such greater movement implies increased road haulage traffic with associated issues of emissions although rail lines have been upgraded thus presenting a means of bulk transport with lower carbon footprint (albeit that rail transport costs and efficiency continue to be a problem in comparison with road haulage). The 'elephant in the room' is that greater port efficiency could facilitate greater movement of coal exports (even though almost entirely transported by rail) the burning of which is clearly contrary to Helsinki Principles⁹⁶.

JC Rating –N/A

EQ 6 Overall Rating:  Partially satisfactory, since the dredger was only operating for three years before it sunk and only at 35% to 50% of capacity.

There is no doubt that the limited dredging activities during the period 201-2016 did contribute to maintenance dredging of the main channel (even allowing for the limited reported operational capacity of the dredger) and that this contributed to more efficient port operations.

For many years the predominant movement of imports and exports to/from the neighbouring countries was by road through Durban rather than through the nearer ports in Mozambique. This was due to relatively higher efficiency of Durban port operations which compensated for the longer road journeys and costs. Improved efficiency at Beira certainly encourages shippers to consider Beira as a viable alternative to Durban (as does improved rail links to the port) thus potentially reducing road transport emissions as simultaneously increased port traffic might increase these same emissions.


The main issue of contention is that this project facilitates activities which increase GHG emissions (road transport and coal burning). It is difficult to argue that this may constitute an 'unintended effect'. However, using the Beira Corridor reduces road freight distances to Malawi, Zambia and Zimbabwe in comparison with ports further south such as Durban, so that overall, there is a net reduction in greenhouse gas emissions.

EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1	Satisfactory development outcomes (using DAC definition of impact)
<p>Apart from improved national and regional economic development (including associated indirect employment generation) and some (relatively limited direct employment generation) reclamation activities were expected to lead to reduced costs of construction and development in Beira. Infilling of low-lying ground was also expected to assist in reducing the incidence of swampy areas particularly in the wet season, and so reduce the incidence of diseases such as malaria and cholera. Both of these benefits would assist in stimulating economic development in the immediate vicinity of the port.</p> <p>Danida required annual reporting on the indicators identified for the project (the progressive development of the project) for five years after commissioning. The Appraisal considered that the indicators should include facets related to the safe operation of the port and its vessels.</p> <p>While the outputs of the investment can be readily assessed through reports on equipment and infrastructure condition and port operations, measure of outcomes were considered to be more difficult to measure.</p> <p>The below mentioned proposed indicators for the project are generally in compliance with the established principles for indicators under the Mixed Credit Scheme as follows:</p> <p>Output-related indicators:</p> <ul style="list-style-type: none"> • Condition of vessels (maintenance and survey reports) • Condition of the access channel in Beira (depth, width, navigation aids) • Facilities and equipment installed and operational status (relevant units) • Amounts of dredged material (by location, by means of disposal or reclamation) • Safety requirements (port operational procedures, security procedures, fire security and procedures, accident reports for ships and port) • Person-days training <p>Outcome-related indicators:</p> <ul style="list-style-type: none"> • Financial performance of the port including Maritime Services and EMODRANGA (revenue and expenditure annual statements including maintenance expenditure and investments) 	

⁹⁶ In the intervening years huge investments have continued in the Moatize coalfields and these investments have included major realignment of rail lines such that most coal is now exported via Nacala port rather than Beira. However, the issue of the coal burning remains

- Traffic throughput (month/annual totals by relevant categories including transit)
- Vessel throughput (month/annual totals by relevant categories including GRT, consignment size, draft)
- Quality of services including “timely attention” and efficiency (incl. level of port user satisfaction through independent surveys, vessel waiting and service times).

It is not suggested that development outcomes have not been developed as a result of the project, they have (e.g. container handling (TEUs) was projected to rise from 46.775 (2005) to 159.000 by 2020 whereas the recorded figure for 2019 was 259.938 [Source: INE]) although the curtailment of dredger operations in 2016 obviously reduced the project contribution to this outcome. However it was the responsibility of CFM and EMODRAGA to provide the necessary data needed to verify the outcome and output indicators (these were considered likely to be best delivered through the regular quarterly reports required in any event by CFM) but no annual reporting of these indicators has been scrutinised by the evaluation.

JC Rating -  Partially Satisfactory since the dredger was only operating for three years before it sunk and only at 35% to 50% of capacity.

JC 7.2 Strong ESG performance of DSIF projects


Except with reference to the Environmental Management Plan (EMP) there is no reporting of ESG performance ex-ante/ex-post but national environmental regulations were fully complied with as regards the environmental studies undertaken..

JC Rating -  Partly satisfactory

JC 7.3 Satisfactory financial returns and portfolio performance

The appraisal report estimated that CFM⁹⁷ marine services, would be able to be largely self-sufficient given existing and expected future revenues from the ship handling operations. Revenues for EMODRAGA, the operator of the dredger, derived from contract payments from port concessionaires in Maputo and Quelimane. Part of the operating costs of the dredger were to come from the sales of the sand and other materials that it would collect from Beira harbour during its operations. Nevertheless, the AR noted that EMODRAGA's would not be able to cover operating costs with its deficits continuing to be covered by CFM.

Although there is very little actual financial information, it is evident that the late delivery of the ‘Macuti’ in 2013 and the sinking in 2016 resulted in a cessation of dredger operations. The insurance claim related to the sinking of Macuti includes a claim for loss of earnings.

JC Rating –  Partly satisfactory given the short period that the dredger was in operation.

EQ 7 Overall Rating - Partially Satisfactory

Development outcomes were being delivered (e.g. an increase in Beira port container operations container handling (TEUs) was projected to rise from 46.775 (2005) to 159.000 by 2020 whereas the recorded figure for 2019 was 259.938 [Source: INE]) prior to the sinking of the dredger in 2016 obviously that ended outcomes, at least until a repaired boat can resume operations.

While the outputs of the investment can be readily assessed through reports on equipment and infrastructure condition and port operations, measures of outcomes are more difficult to identify and quantify. These outcomes include improvement of regional development in terms of improved sanitation and increased business development.

For EMODRAGA the dredger operator it was not able to use the full capacity of the Macuti during the three years in operation.

Except with reference to the Environmental Management Plan (EMP) there is no reporting of ESG performance ex-ante/ex-post but national environmental regulations were fully complied with as regards the environmental studies undertaken

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
The principal benefits were expected to be (plus wider benefits to the local, national and regional economies as the impact of reduced transport costs underpins expanded economic activity): Reduced delays to shipping	

⁹⁷ CFM (Caminhos de Ferro Mozambique) is a 100% state-owned public enterprise with responsibility for operation and management of the ports and railways in Mozambique including responsibility for provision of safe access to the ports in terms of sufficient water depths in access channels. CFM-Central Maritime Services assets include tugboats, pilot boats and line boat in Beira. CFM has undergone complete reconstruction with most of the railways and ports which it used to operate having now been concessioned although CFM still has substantial minority stakes. As a result it now has to operate in a much more commercial environment. EMODRAGA, the dredging company, is a 100% state owned public enterprise with main assets consisting of the various dredgers financed by Japan and Denmark. Thus, CFM was the main client and main source of revenue for EMODRAGA. Today, the concessionaires of the various ports are the main clients for maintenance dredging

In 2006 due to the silted up navigation channels ships were waiting on average 30 to 33 hours to dock. As a result several shipping lines were using smaller vessels than the commercial capacity/demand situation would normally have dictated for the trade to and from Beira. Re-opening the dredged, deeper channel to allow access to all ships at all states of the tide and day and night would effectively remove this cause of cost in port operation. It was estimated that reducing the delays by on average at least one day per ship could lead to savings of US\$5-7 million per annum initially and rising with increasing trade and ship arrivals.

Impact of using larger vessels

Larger ships on international main routes can provide effective transport at lower unit prices because of the large volumes and use of specialist equipment at their relatively few ports of call. Deliveries to Beira were more expensive as a result of restricted draft. Deepening the channel would also allow larger consignments to be delivered in ships with deeper drafts. As a result, the most immediate effect could be a reduction in the number of ships required to deliver the same volume of cargo to Beira. This would also result in lower port access charges overall for vessels using the port.

Additional revenues from reclamation

There was estimated to be scope for generating additional revenue from land reclamation activities and from the sale of reclaimed sand for building purposes. Reclamation activities were also expected to lead to reduced cost of construction and development in Beira. Infilling of low lying ground should also assist in reducing the incidence of swampy areas particularly in the wet season, and so reduce the incidence of diseases such as malaria and cholera.

Better use of port infrastructure


Opening the access channel would enable ships to leave promptly, freeing berth space and extending the time before necessary additional capacity would be required.

Results

Demand was forecast to rise to about 3,8 million tons over the 25 year evaluation period to 2033 (3,3 million tons by 2020) which would be well within the estimated capacity of the existing port infrastructure but was contingent on faster turnaround of ships in the port. With the channel deepened the average consignment size was expected to rise and, as a result, forecast increases in trade could be delivered in a smaller number of larger ships and delays for all but the biggest ships would be eliminated whilst the practice of part loading could be discontinued with resulting savings in transport costs. The overall impact of these very direct savings was estimated to provide an economic rate of return of about 20%⁹⁸.

Distribution of benefits

Savings arising from the channel deepening are real and accrue directly to those using the port. Once the market has adjusted, savings could be reflected in reductions in the cost of transport through Beira. A significant proportion of this benefit would accrue to transit traffic and thus benefit regional economies. It should, of course, be noted that

JC Rating –  Partly satisfactory due to fact that dredger only operated for 3 years and at no more than 50% of its capacity. Port operations are still limited by silting up of the navigation channels. The economic viability of the project is yet to be established.


JC 8.2 Level of commercial/financial viability of infrastructure

The project, when considered as a whole, was found to be financially/commercially non-viable. The projected net cash-flow was not be sufficient to repay a commercial loan over a period of 10 years and consequently financial assistance from CFM and/or the GoM was required. The limited activity of the 'Macuti' between 2013 and 2016 actually increased further the expected levels of financial non-viability. However, the economic assessment indicated that the investment could be considered economically viable and economic benefits supported the view that a suitably reopened and maintained access channel to Beira port would supportable. Again the demise and repair of the dredger which should re-enter service in mid-2021 is likely to deliver, albeit delayed until about 2033 a degree of the economic viability. Otherwise the project is considered likely to be (eventually) institutionally, technically and financially sustainable.

JC Rating –  Partly satisfactory

JC 8.3 Level of improvements in ESG achievement

Overall it is considered that ESG risk management was comprehensively covered in project design. The project was expected to deliver improved coverage of ESG issues and despite the accident leading to the sinking of the dredger it is expected that the expected improvement should eventually be delivered after the return to service of the dredger in mid-2021.

JC Rating –  Partially Satisfactory

EQ 8 Overall Rating – Partly satisfactory

Overall the project is considered likely to be (eventually) economically, socially and environmentally sustainable but only at a later date than expected due to the demise of the 'Macuti' in 2013 and the eventual return to service in 2021.

⁹⁸Benefits from additional direct surplus revenue from reclamation were included while any induced economic development from lower transport costs would be additional.

Level of economic viability were assessed considering Costs and Benefits including reduced delays to shipping, impact of using larger vessels, additional revenues from reclamation, better use of port infrastructure and employment generation. Demand forecasts used in the original economic analysis (to 2020) have been considerably exceeded by 2019 (but obviously, the contribution of the 'Macuti' to facilitating such increased port traffic is limited). A limited re-run of the appraisal economic analysis taking into account the actual circumstances of 'Macuti' operations using the original projections the EIRR is negative; using the actual figures and assuming a return to service of 'Macuti' in 2021 a modest positive EIRR is tentatively estimated by 2033⁹⁹.

Savings arising from the channel deepening are real and accrue directly to those using the port. Once the market has adjusted, savings could be reflected in reductions in the cost of transport through Beira. A significant proportion of this benefit would accrue to transit traffic and thus benefit regional economies. The project was found to be financially/commercially non-viable - the projected net cash-flow would not be sufficient to repay a commercial loan over a period of 10 years and consequently financial assistance from CFM and/or the GoM was required. The limited activity of the 'Macuti' between 2013 and 2016 actually increased further the expected levels of financial non-viability. As noted above the demise and repair of the dredger which should re-enter service in mid-2021 is likely to deliver, albeit delayed until after about 2030 a degree of the economic viability. Otherwise the project is considered to be (eventually) institutionally, technically and financially sustainable.

Overall it is considered that ESG risk management was comprehensively covered in project design. The project was expected to deliver improved coverage of ESG issues and despite the accident leading to the sinking of the dredger it is expected that the expected improvement should eventually be delivered in the years after the return to service of the dredger in mid-2021.

<p>EQ 10 Project risk management of DSIF</p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
<p>JC 10.1 Quality of risk management systems and policies on long-term sustainability</p>	
<p>The AR identified the following major risks:</p> <p>Market Conditions – it was considered possible that traffic projections were too optimistic.</p> <p>Insufficient priority given to dredger maintenance</p> <p>Effective use of dredging capacity - EMODRAGA's expanded capacity would be available throughout Mozambique for both dredging and reclamation although there was considered to be a risk of priorities being determined by conflicting commercial priorities or other commitments rather than in the primary task of maintaining the Beira channel. The 'Macuti' was to be based at Beira with its principal task maintenance dredging of the main access channel (the proposed survey and navigation aids were considered essential to ensure that precision dredging was at exact specified locations and dimensions; the monitoring regime expected reporting of surveys of access channels (to Beira, Maputo and Quelimane).</p> <p>Utilisation of Surplus Dredging Capacity - EMODRAGA was considered likely to have surplus dredging capacity available for channel maintenance when both the Japanese dredgers and the 'Macuti' (as replacement for the 'Rovuma') were fully operational and there was considered to be a risk that this would not be optimally utilised. The 'Macuti' was to be based at Beira with its principal task to maintain the access channel¹⁰⁰. It was proposed that surplus capacity could be used to provide reclamation material¹⁰¹ for use in Beira and the surrounding region and which could generate commercial returns as well as substantial economic benefits through improved sanitation and releasing land for development.</p>	

⁹⁹ This tentative conclusion would be conditional upon full operational capacity of the 'Macuti' after return to service in 2021 i.e. improved performance compared with the operational period 2013 - 2016

¹⁰⁰ The EMODRAGA plan was to use mainly 'Macuti' for the maintenance dredging of the main access channel. The other two Japanese dredgers would be used for the maintenance dredging of the other parts of Beira Port and for other ports. When the 'Macuti' was out of the Port, the other two dredgers would implement maintenance dredging of the access channel.

¹⁰¹ i.e. sand; silt from the bottom of the channel would be dumped

Overall identified risks were realistic as were proposed mitigation measures, most of which were actually implemented – the unfortunate sinking of the dredger did not negate these risks and the continuation of mitigation measures is expected when the dredger returns to service in mid-2021.

JC Rating – Satisfactory 

JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

Monitoring indicators were proposed at Appraisal stage for output and outcome levels. However, regular reporting against these outcome indicators was not actually undertaken on a regular basis as no such reporting was available to the evaluation (or during the field visits). The ‘*Verification Report*’¹⁰² noted that the “*Delivery and Acceptance Protocol*” was signed 28/04/2013.

The below mentioned proposed indicators for the project are generally in compliance with the established principles for indicators under the Mixed Credit Scheme as follows:

Output-related indicators:

- Condition of vessels (maintenance and survey reports)
- Condition of the access channel in Beira (depth, width, navigation aids)
- Facilities and equipment installed and operational status (relevant units)
- Amounts of dredged material (by location, by means of disposal or reclamation)
- Safety requirements (port operational procedures, security procedures, fire security and procedures, accident reports for ships and port)
- Person-days training

Outcome-related indicators:

- Financial performance of the port including Maritime Services and EMODRANGA (revenue and expenditure annual statements including maintenance expenditure and investments)
- Traffic throughput (month/annual totals by relevant categories including transit)
- Vessel throughput (month/annual totals by relevant categories including GRT, consignment size, draft)
- Quality of services including “timely attention” and efficiency (incl. level of port user satisfaction through independent surveys, vessel waiting and service times).

No consideration appears to have been carried out of ‘lessons learned’. Whilst the indicators are all reasonable at least some of the indicators identified as ‘outputs’ relate to use of the delivered equipment and are actually outcome indicators (e.g. direct – vessel condition and dredged material; indirect – condition of access channel). It was reported during the field visits that no such reporting of monitoring has taken place (over the specified 5 years post commissioning) and such information was not made available.

It was noted at appraisal that whilst the outputs could be ‘*readily assessed*’ through reports on equipment and infrastructure condition and port operations, measures of outcomes would be more difficult to measure. Such identified outcomes included improvement of regional development in terms of improved sanitation and increased business development. There are no proposed monitoring indicators for these (indirect) outcomes or for employment generation (direct and indirect).

JC Rating –  Partly satisfactory




EQ 10 Overall Rating –  Partly satisfactory

No logical framework was prepared. Although monitoring indicators of output and outcome progress were identified it is not clear whether or not regular monitoring was actually carried out over the specified 5 year period post-commissioning (no progress reporting has been scrutinised by the evaluation and no such information was made available during the field visit meetings with CFM and EMODRAGA). Whilst the indicators are all reasonable at least some of the indicators identified as ‘outputs’ relate to use of the delivered equipment and are actually outcome indicators. It was noted at appraisal that whilst the outputs could be ‘*readily assessed*’ through reports on equipment and infrastructure condition and port operations, measures of outcomes would be more difficult to measure. Such identified outcomes included improvement of regional development in terms of improved sanitation and increased business development. There are no proposed monitoring indicators for these (indirect) outcomes nor for employment generation (direct and indirect)

Risks were identified, mainly operational including an enigmatic reference to surplus dredging capacity arising from Danida’s financing of Macuti and parallel Japanese funding of other dredgers (although, as things turned out, such possible surplus capacity did not come about). Overall, identified

¹⁰² FS-Consult

risks were realistic as were proposed mitigation measures, most of which were actually implemented – the unfortunate sinking of the dredger did not negate these risks and the continuation of mitigation measures is expected when the dredger returns to service in mid-2021

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
<p>The quality and appropriateness of the RMS is mixed. The indicators are reasonable measures of project activities (e.g. person days of training), maintenance of the delivered equipment (e.g. condition of vessels), together with effectiveness of use of the vessels (condition of access channel, amounts of dredged material), facilitating financial provision of operations (financial statements of EMOBRAGA and Maritime Services) and outcomes (port traffic). But as no reporting has been carried out for the specified 5 years post-commissioning and no such monitoring information was made available to the field visit only limited outcome information is available (e.g. dredger operation during the period 2013 – 2016 reported to be 35-50% of capacity; projected container handling for 2020 (TEU) 159000, actual 2019 259938). Given that the dredger only operated for about 3 years before sinking (with reported limited capacity during that period) and is expected to return to service mid-2021, obviously the expected contribution of 'Macuti' to maintenance dredging of the main channel has not been realised. On the other hand port handling of containers has exceeded projected figures such that the development of the port has continued nevertheless (and consequent indirect regional and economic developments impacts can be inferred).</p> <p>JC Rating – Partly satisfactory </p>	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>The proposed project indicators are compliant with the established principles for indicators under DSIF:</p> <p>Output-related indicators:</p> <ul style="list-style-type: none"> • Condition of vessels (maintenance and survey reports) • Condition of the access channel in Beira (depth, width, navigation aids) • Facilities and equipment installed and operational status (relevant units) • Amounts of dredged material (by location, by means of disposal or reclamation) • Safety requirements (port operational procedures, security procedures, fire security and procedures, accident reports for ships and port) • Person-days training <p>Outcome-related indicators:</p> <ul style="list-style-type: none"> • Financial performance of the port including Maritime Services and EMOBRAGA (revenue and expenditure annual statements including maintenance expenditure and investments) • Traffic throughput (month/annual totals by relevant categories including transit) • Vessel throughput (month/annual totals by relevant categories including GRT, consignment size, draft) • Quality of services including "timely attention" and efficiency (incl. level of port user satisfaction through independent surveys, vessel waiting and service times). <p>It was noted at appraisal that whilst the outputs could be 'readily assessed' through reports on equipment and infrastructure condition and port operations, measures of outcomes would be more difficult to measure. Such identified outcomes included improvement of regional development in terms of improved sanitation and increased business development. There are no proposed monitoring indicators for these (indirect) outcomes or for employment generation (direct and indirect).</p> <p>Regular reporting against these outcome indicators was not actually undertaken on a regular basis and no such reporting was made available to the evaluation during field visits.</p> <p>JC Rating –  Partly satisfactory</p>	
<p>EQ 11 Overall Rating –  Partly satisfactory</p> <p>The RMS could have met the needs of providing data on some direct outcomes of project activities if actually consistently actioned but indirect development outcomes were not covered in the proposed monitoring framework.</p>	

The indicators are reasonable measures of project activities, maintenance of the delivered equipment, together with effectiveness of use of the vessels, facilitating financial provision of operations and direct port outcomes. However, as no reporting was carried out for the specified 5 years post-commissioning and no such monitoring information was made available to the field visit only limited outcome information is available upon which the effectiveness of the RMS can be assessed. Although the dredger only operated for about 3 years before sinking (and with reported limited capacity during that period), the expected contribution of 'Macuti' to maintenance dredging of the main channel has not been realised. On the other hand port handling of containers has exceeded projected figures such that the development of the port has continued nevertheless (and consequent indirect regional and economic developments impacts can be inferred).

It was noted at appraisal that measures of (indirect) outcomes would be more difficult to measure. Such identified outcomes included improvement in terms of improved sanitation and increased business development in the Beira area and to regional economic development (in Mozambique and neighbouring countries) and employment generation. There are no proposed monitoring indicators for these (indirect) outcomes or for employment generation (direct and indirect).

Regular reporting against these outcome indicators was not actually undertaken on a regular basis and no such reporting was made available to the evaluation during field visits.

No 'Lessons learned' have been reported.

Field visits and calls

12.1.1 Introduction

During the field visits (undertaken by José Chiburre, facilitated by Paulino d'Uambo) meetings were held with Empresa Moçambicana de Dragagem (EMODRAGA), Caminhos de Ferro de Moçambique (CFM) and Instituto Nacional de Hidrografia e Navegação (INAHINA between 23/03/2021 and 09/04/2021.

People met: Adélio Dias (CFM), Eng Bié (CEO EMODRAGA) Simão Mungumbe (INAHINA). See full details in annex 1

The meetings took place from March 23rd to April 9th in Maputo

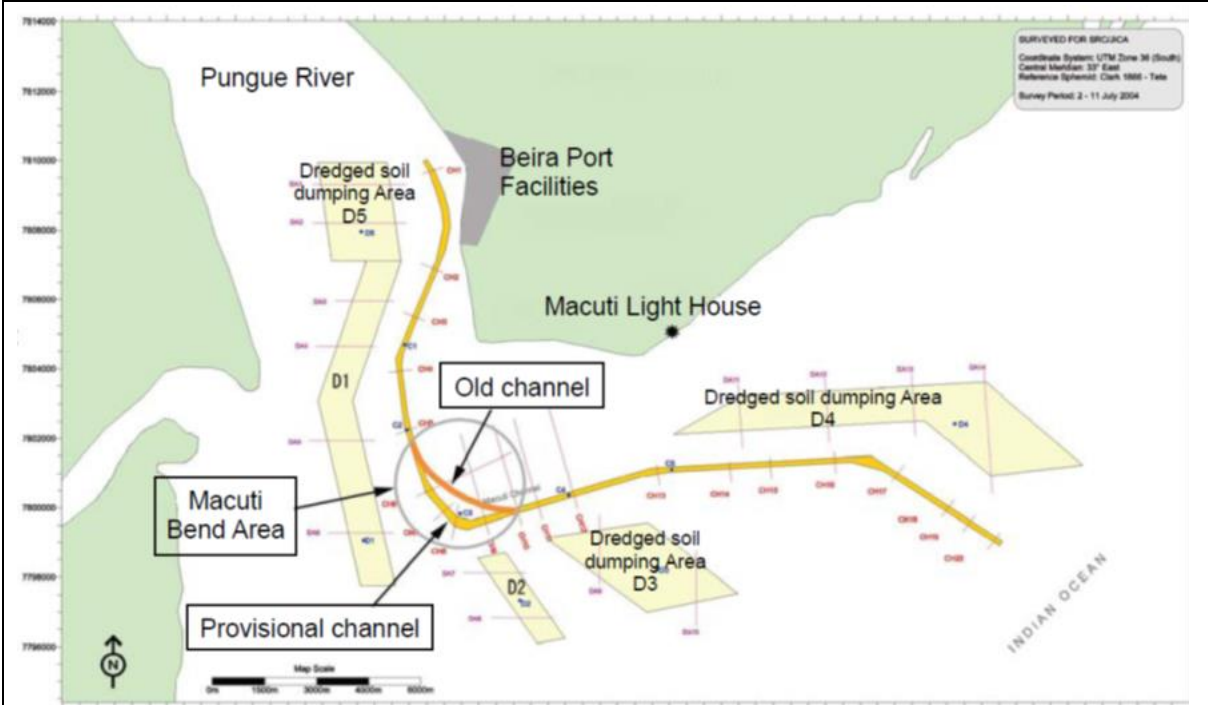
Institutions interviewed: Empresa Moçambicana de Dragagem (EMODRAGA), Caminhos de Ferro de Moçambique (CFM) and Instituto Nacional de Hidrografia e Navegação (INAHINA).





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MarineTraffic.com

www.clubofmozambique.com/news/mozambique-dredge-collides-with-cargo-ship-in-beira/



Source: The Republic of Mozambique “Basic Design Study Report on the JICA Project for reinforcement of the Dredging Capabilities for Beira Port” (December 2004)

12.1.2 Findings

The Mozambican Government requested financial support from Danida with the purpose of increasing the dredging capacity and improving operations in the port of Beira, through the rehabilitation and

maintenance of the Beira Access Canal, to help supply with goods to the central provinces in Mozambique and to inland countries such as Zambia, Zimbabwe and Malawi who rely mostly on the Port of Beira for imports and exports of products. The request was preceded by a feasibility study and an Appraisal. This process took place between 2003 and 2006, and the approval for funding was later in 2006. The decision to finance the dredger was quick.

The dredger (Macuti) was fabricated in Lithuania. It was tailor made to Beira Port, i.e. it was made to fit into Beira specifications, including the dock, so that it can be repaired in Beira. The dredger was handed over to EMODRAGA in June 2013 and started functioning from 2013 to 2016 when it collided with a large ship owned by the Mediterranean Shipping Company (MSC). The Dredger was salvaged three months after.

12.1.2.1 Dredger Operation

The dredger was too modern for the (by then) existing intellectual capacity. Despite Danida having trained EMODRAGA staff, having sent EMODRAGA technicians to Lithuania and having on-the-job-training, and providing technical assistance, the dredger was only operated at about 70% of its capacity, during the three years of operation. Danida did what had to be done. The lower performance of the dredger was partly attributed to management issues, as there was technical and operational capacity which was never fully used.

While the Hydrography department worked well, the Production and Machinery department did not fully use their capacity - they relaxed! That is why EMODRAGA had a lot of technical problems.

12.1.2.2 Dredger Repair and disputes

An international tender was launched, and 9 companies bid for the repair for the dredger, including Beiranave (who also provided space for the repair of the dredger in Beira) and Western Baltija Shipyard, the Lithuanian company that fabricated the dredger. The insurance company (**Ímpar**) was leading the procurement process for the repair of the dredger, and opted DORMAC from Durban, South Africa, because it presented the lowest price for repair.

Currently the price presented by Western Baltija Shipyard for repair has been exceeded due to costs associated with the delays in the repair and the prejudice of not having the dredger operational, from the time it was supposed to be handed back. It is regrettable that Western Baltija Shipyard was not selected, as EMODRAGA would be comfortable with the quality of the repair and timely delivery back of the dredger.

The dredger is expected to return to Beira end of July 2021, after having been towed in 2016. It has taken more than four and half (4,5) years to repair the dredger by DORMAC, while it took just two (2) years for Western Baltija Shipyard to fabricate it.

Before the dredger is returned to Beira, it will be inspected by experts that include Mr Christian Lung and an expert from NAVAL who were (both) part of the dredger designing team.

Part of the delays were because Ímpar indicated that the ship had problems with the engine, and experts were asked to assess the dredger problems and concluded that all the problems were due to the collision. This discussion took almost a year, and it was cleared after the assessment by experts.

While the repair is under the responsibility of Ímpar, EMODRAGA has been asked to cover part of the cost, especially the overstay of the dredger in Durban, part of the repair and some spare parts which are said to be of EMODRAGA responsibility. The cost of repair is being shared by both Ímpar and EMODRAGA.

However, Ímpar sued MSC for the collision with the dredger in the Court of London. Ímpar won the case and MSC paid Ímpar for the damage caused to the dredger an amount believed to be higher than any amount quoted for the repair.

Because the dredger had a valid insurance and Ímpar was paid enough money for the repair of the dredger, EMODRAGA sees no reason to be paying part of the cost for the repair of the dredger. EMODRAGA's position of not paying part of the repair was presented to Ímpar, who did not agree with EMODRAGA.

Lene Mollerup (DSIF investment director), who has a great passion for the dredger, has been following on the progress of the repair of the dredger, after Danida's earlier effort to assist EMODRAGA was not accommodated soon after the dredger sunk. Now with the new CEO, Lene is in direct contact with the CEO and working together to get the issue of the dredger resolved and get the money EMODRAGA, unfairly paid as part of the repair of the dredger.

In an attempt to get the money EMODRAGA contributed for the repair of the dredger, EMODRAGA with the assistance of Danida have engaged a Law firm (HAFNIA LAW FIRM LPP) represented by Andres

Amstrup Fournais (Specialist in BIMCO Contracts) to legally assist EMODRAGA in getting their money back from Ímpar.

12.1.2.3 Danida's Strengths

- Strong presence and know how
- Serious and committed in what they do
- Passionate about Mozambique
- Made themselves available to assist Mozambique, immediately after the accident with the dredger. Unfortunately, EMODRAGA did not accept their assistance at that time
- Danida is very considerate - Now Danida is back again to assist EMODRAGA in solving the problem that involves EMODRAGA partly paying for the dredger repair.
- Working with Danida is excellent, they are impartial and deal with issues in the right manner possible.

12.1.2.4 Weakness

- Suspension of the support to Mozambique – it is sad for Mozambican institutions who benefited from Danida support and know how Danida works.

12.1.2.5 EMODRAGA Prospects

EMODRAGA is autonomous and doesn't receive funds from the government, instead, EMODRAGA channels the navigator assistance tax to the national treasure. So, it must sustain itself, therefore:

- EMODRAGA aims at creating capacity in marine area because the Indian Ocean is the greatest and endless wealth Mozambique has. Unfortunately, Mozambique has weaknesses where it has greater wealth, such as navigation, oil and gas.
- Invest in the purchase of an additional dredger similar or bigger than Macuti.

13 Mozambique: Rehabilitation Regional Airports

Overview


Key issues, highlights and lessons learnt	
<p>The main purpose of this project was to ensure safety in accordance with ICAO requirements – this extract is from the Appraisal Report: <i>Safety is the main issue which needs more attention at most airports and aerodromes in Mozambique to meet minimum ICAO requirements. With the use of larger aircraft in a rapidly developing economy there is a need to move the domestic airports onto a correspondingly appropriate level of safe operation. This is what ADM has been doing as resources have permitted. The aim of this investment is to permit ADM to meet primary safe operational needs as rapidly as possible at the three provincial airports at Beira, Quelimane and Tete.</i></p> <p>And yet this certification process did not go ahead immediately after certification of completion of the project works.</p> <p>In May 2013 this certification process was considered by DSIF when it was agreed that: <i>ADM and Danida plan to prepare jointly the three airports in Mozambique for ICAO certification. This preparation includes the contracting of a consultant service to assist ADM in areas such as establishing Quality and Safety Management Systems including handbooks and training, completing the aerodrome manuals, etc. This consultant service would be contracted for after a tendering process. The tender specification for the required service is almost complete, so the tendering process can be initiated in the near future.</i></p> <p>However, by November 2015 the process had stalled as, despite DSIF efforts to go ahead and prepare the ICAO certification (including provision of a consultant) ADM declined to go ahead (because they found the proposed methods and processes too complicated). It was reported that in 2017/2018 the certification process for the Beira airport re-started, and while the process was underway, the airport infrastructures were damaged by the first and the strongest cyclone (Idai) which resulted in damage to perimeter security fencing, drainage systems, buildings and some electronic and navigation aids plus soil erosion at various locations.</p> <p>Other aspects concerning fire-fighting capability which also affected certification (according to the key informants at Beira airport)</p> <ul style="list-style-type: none"> • The firefighting capacity in Beira airport: Currently, Beira airport has two vehicles in the firefighting brigade with the total capacity of 13.100 litres (12.000+1.100). The certification standards demand that the airport should maintain a permanent capacity of at least 12.100 litres. There being only two vehicles, in case the one with 12.000 litres has a breakdown there is not enough back up to maintain the airport capacity required by ICAO standards. • Lack of direct access from the firefighting brigade to the airstrip: Certification standards require that there is direct access from the firefighting base to the airstrip – such access doesn't exist in Beira airport • Lack of pavement in the manoeuvring area of firefighting vehicles • Lack of access from the firefighting base to the airport fencing and to all the airport gates <p>In essence the situation now is similar to that which justified the project implementation almost 15 years ago. Some electronic, navigations aids and communication equipment requires replacement (and in some cases up-rating to modern standards), firefighting capacity does not meet ICAO requirements (and the fire tenders are not adequately maintained) whilst the perimeter fencing is broken in sections thus raising security issues. Certainly ICAO certification is not possible today without another, similar round of investment. On the other hand all three airports continue to be operational (and served by 737 aircraft) despite operational constraints (and safety concerns) from continuing use of increasingly ineffective equipment. All airports have demonstrated a significant increase in passenger numbers, movement of cargo and mail whilst aircraft movements have increased to a lesser extent thus supporting the project assumption that the investments would enable the use of larger aircraft (albeit that projected figures for Quelimane and Beira have turned out to be optimistic). On the other hand Tete has recorded very large increases across all criteria. It may thus be argued that this DSIF investment fulfilled its objectives in ensuring such operations for the past 15 years</p>	

Summary	
Project name	Rehabilitation of Regional Airports
Type of project	Transport
Project No.	104.0.30.Mozambique.2.
Description	Rehabilitation and Improvement of Beira, Quelimane and Tete Airports
Sector	Aviation – Transport
Country	Mozambique
Sponsor	Ministry of Finance
Other stakeholders	Aeroporto de Mozambique (ADM)
Clearance in principle	The original project budget (PROJEKTBEVILLING) 28/11/2005 DKK 130,37 million was subsequently increased (Revideret Forside ProjektBEVILLING 25/06/2007) DKK 167,63 million presumably when tenders for the works, TA and consultancy services were received.

Summary						
Approval/Binding Commitment	28/11/2005	Loan / Investment Agreement Date			25/06/2007	
Danish Bank	Danske Bank					
Loan Duration + Grace Period	Original 15 years (0 grace period) Revised 10 years (0 grace period)					
Project Amount and funding plan			Original		Revised	
	Financial data		DKK/ million	USD/ million	DKK/ million	€/ million
	Amount financed		130,37		167,63	
	Loan Amount		130,37		125,09	
	Maturity		15 years		10 years	
	Grace		0		0	
	Total Subsidy Element		50,31%		50,06%	
	Total grant Cost (Exchange rate DKK/USD - €)		6,25		7,45	
	Total		89,08	13,94	106,20	14,26
	Interest Rate Subsidy (CIRR + 0,2/+0,75 = 6,03)		49,09	7,68	33,17	4,45
	EKF Premium CIRR + 0,2 = 5,51		26,61	4,16	14,27	1,92
	Bank Margin		1,60	0,25	1,17	0,16
	Extra Grant Amount		-	-	42,26	5,67
	Appropriation for Technical Assistance		3,50	0,55	5,50	0,71
	Test Run Verification, etc.		0,18	0,03	0,18	0,03
Budget Margin 10%		8,10	1,27	9,65	1,29	
Total Budget		130,37		167,83		
Total Project Investment						
Danish Contract: DKK		130,37		167,63		
Financing Bound						
Danish Exporter	E. Pihl & Son in JV with Semco Maritime					
MFA guarantee	Date		Amount		Duration	
Implementation status	Implementation complete – Quality Certificate issued 10/10/2011					
Feasibility study details	Danida undertook a pre-Appraisal of the project proposal in August 2005 to assess the existing documentation, collect additional project information and to undertake an overall assessment of the suitability of the project for mixed credit financing. Pre-Appraisal of Domestic Airports in Mozambique, Sept 2005, COWI					
Subsidy – rationale and key features	Total subsidy element: 50,31% (OECD)					
Country Context	<p>Aeroportos de Moçambique (ADM) is responsible for operation, maintenance and development of 19 principal commercial airports in Mozambique including three international airports, seven provincial secondary airports and nine smaller aerodromes.</p> <p>Mozambique is nearly 2.000 km north to south and varies between 200km and 800km east to west. While principal roads are generally in good condition, the lower quality secondary and tertiary road networks make regional travel difficult especially in the rainy seasons. The airports facilitate communications across a large national area where alternative means of transport by road can be arduous and time consuming. In this situation the strategic role of air transport is critical for national security, effective administration and economic development</p> <p>Aviation services provide a vital link in the national communications network. The three airports under consideration were identified during the 1998 Mozambique Airport Study as needing investment.</p> <ul style="list-style-type: none"> • Beira: the second city of Mozambique which also is a regionally significant port which is a gateway for the interior as well as for land-locked Zimbabwe, Zambia and Malawi. • Quelimane: the administrative capital of Zambezia Province, a port and fishing centre. 					

Summary	
	<ul style="list-style-type: none"> • Tete: the capital city of Tete Province, located on the Zambezi River close to the Cahora Bassa hydro-electric dam and the Moatize coalfields. <p>The key issue addressed by the project was to provide a suitable and sustainable level of airport service – both in the number and location of airports and in the level of facilities provided at those airports. Safety was identified as the main issue which needed more attention at most airports in Mozambique to meet minimum ICAO requirements. With the use of larger aircraft in a developing economy there was a recognised need to bring domestic airports to an appropriate level of safe operation and ADM was been doing this as resources permitted. The aim of this investment was to permit ADM to meet primary safe operational needs as rapidly as possible at the three provincial airports at Beira, Quelimane and Tete.</p>

Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>At Appraisal Stage it was determined that the project aligned with MFA development policies i.e., Appraisal Report 11: Justification for Danida Support.</p> <p>The project was considered to be in accordance with Danida's overall development aim to reduce poverty by increasing regional development and economic growth in the three project areas at Beira, Quelimane and Tete. The airport projects would contribute to the support of economic development as increased passenger numbers generate additional income to local businesses, suppliers, restaurants and hotels. Furthermore, employment would be generated both as part of the direct project implementation and also through additional services to be supplied in the airport.</p> <p>The project was expected to be in line with Danida requirements concerning the environment. The main elements of the project were replacements for already existing infrastructure or equipment. While the project would support increased use of airspace and air travel, the direct impacts were on communities already adjusted to the visual and aural intrusion. Alternative travel by land was considered to be unlikely to be significantly more costly than by air.</p> <p>The project was considered unlikely to be discriminatory between men and women and should be able to provide equal opportunities for improvements in living condition. The project was also considered to be neutral with regard to promotion of democratic and human rights. To the extent that it promoted and secured safer and more efficient movement of cargo through the country and region it encouraged regional co-operation as well as national cohesion.</p> <p>The project was considered generally in accordance with GoM's overall development plans for the sector in Mozambique.</p> <p>The project was "non-financially viable", while it could be considered to be economically worthwhile. Provided that the conditions for support were followed, the project was considered to be institutionally, technically and financially sustainable.¹⁰³</p> <p>The project was also found to be compliant with requirements for Danish Mixed Credit Support (Appraisal Report)</p> <p>The Danish Ministry of Foreign Affairs (Danida) entered into a framework agreement with the Ministry of Finance in Mozambique regarding financing of development projects in Mozambique with Danish mixed credits. For LDC countries there were no longer requirements of financial (commercially) non-viability, while the requirement of economic viability still remained. Further, there were no requirements for minimum Danish content of goods and services including related services such as transportation, insurance, installation, commissioning, training and spare parts.</p> <p>JC Rating – Satisfactory </p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	

¹⁰³ The project, whether considered at the level of the individual airport or as a whole, is unlikely to be financially/commercially viable. The projected net cash-flow would not be sufficient to repay a commercial loan over a period of 10 years and consequently financial assistance from ADM and/or the GoM would be required. The economic assessment indicates that the investment could be considered economically viable. Quantified and unquantified economic benefits support the view that a single low capacity airport at each of the three provincial capitals is supportable. Source: Final Report, Appraisal, Domestic airports in Mozambique, November 2005 Jacobs Consultancy Ltd

In March 2004 the Government of Mozambique (GoM) made a request to the Danish Government for financial assistance for rehabilitation and improvement of Beira, Quelimane and Tete airports under Danida's Mixed Credit Programme. Danida undertook a pre-Appraisal of the project proposal in August 2005. As the pre-Appraisal assessment was positive, a full Appraisal Mission was undertaken in September 2005. The Appraisal team visited and inspected the three airports under consideration. The Appraisal makes extensive use of the pre-Appraisal draft report and discussions with relevant authorities, institutions and airlines in Mozambique. The project was found to be compliant with the national development plans (i.e. PARPA).

PARPA (Action Plan for the Reduction of Absolute Poverty), the objectives of which were:


- to remove administrative barriers to investment
- to create a favourable economic environment so as to attract more investment to the country, and
- to support economic development in order to reduce absolute poverty

Government sector strategy was also discussed at Appraisal Stage:

The Government of Mozambique operates its planning within a series of 5-year plans with more detailed programmes for each of the different sectors including transport and communication. The development of the transport sector, including airport and aerodromes, is given high priority and is in line with the requirements for national economic growth.

In many developing countries tourism has been proven to be a significant catalyst for economic growth and job creation. Tourism accounts for 7,5% of jobs in Sub-Saharan Africa and creates significant opportunities for women, unskilled workers and SMME's. The Government of Mozambique sees the development of tourism as an objective that cuts across many of these sectors and that has significant potential for contributing to the economic development of Mozambique.

No reference was made specifically to stakeholders' views but given the recorded levels of consultation undertaken at Appraisal Stage and the original request from the Mozambique Government for Danish support it was concluded that alignment with stakeholder views was satisfactory. This alignment was confirmed during field visits in Q2 2021.


JC Rating - Satisfactory 

JC 1.3 Added value of Project Preparation Facility (PPF)

Although there is no reference to the Project Preparation (PPF) Danida undertook a pre-Appraisal¹⁰⁴ of the project proposal in August 2005 to assess the existing documentation, collect additional project information and to undertake an overall assessment of the suitability of the project for mixed credit financing. At this time the investment was re-estimated at US\$ 15 million at 2005 prices.


The pre-Appraisal assessment was positive a full Appraisal Mission should be undertaken.

The Appraisal Mission in Mozambique was undertaken from 3rd to 12th September 2005 during which time the team visited and inspected the three airports under consideration. The team was able to study relevant background documents which were collected during the pre-Appraisal and make extensive use of the pre-Appraisal draft report and have discussions with relevant authorities, institutions and airlines in Mozambique. The Appraisal Report was completed in November 2005¹⁰⁵.

JC Rating – Satisfactory 

JC 1.4 Complementarity with development partners operations and strategies

Donor assistance to the aviation sectors had not taken place in recent years and the Mozambique Airport Study (MAS) from 1998 financed by African Development Bank was the latest contribution. Sida and Danida assisted the domestic airports for rehabilitation in 1984, 1986 and 1992 respectively. Some of the equipment inspected at the three airports during this Appraisal Mission in 2005 could be clearly identified as having been put in place at these times – much of it though obsolete still being in operation.

JC Rating - Satisfactory 

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

At Appraisal Stage the incremental development impact was assessed as follows:

The economic development impact focuses on the costs and benefits that could result from the project such as:

- time savings within the airport (improved facilities at peak hours)
- time savings compared to alternative means of transport (road, rail, etc)
- local and regional economic development (job generation, increased activities both inside and outside of airports)
- local and regional consumption by air passengers including lodging, local transportation and retail purchases
- induced impacts including activities of suppliers to the businesses at the airports (office supplies, fuel, spare parts, etc)

As congestion was considered as unlikely to be encountered in either the airside and/or the landside over the forecast period time savings for users were likely to be small and were not considered further.

Wider development benefits identified included:

¹⁰⁴ Pre-Appraisal of Domestic Airports in Mozambique Draft Report, September 2005, COWI

¹⁰⁵ Final Report, Appraisal, Domestic airports in Mozambique, November 2005 Jacobs Consultancy Ltd


- improvement of living conditions for the populations
- development of small local enterprises and other commercial activities
- employment opportunities generated from airport activities
- increases in value of land

Although the economic benefits were difficult to quantify, an indication was made of some of the measurable net benefits that might be generated from the investments such as employment during rehabilitation, and increased tourism and business activities including employment. The analysis of the likely net benefits based on estimates of salary levels, scope of employment and value of tourism and business. These assumptions are set out below.

Assumptions for estimation of measurable economic net benefits for investments

<i>Development Element</i>	<i>Assumed Value</i>
Value of employment from tourism/business	US\$ 1.500/year
Number of employees (BEIRA)	150 from investment
Number of employees (QUELIMANE)	100 from investment
Number of employees (TETE)	75 from investment
Growth in number of employees	2%/year
Value of receipts from tourism and business	US\$ 50/day
Value of costs from tourism and business	US\$ 37,5/day
Duration of stay of tourists/businessmen	2,5 days
Employment during construction	2% of investment

Overall the expected developmental benefits were limited. Nevertheless, in a country as large as Mozambique with long driving distances between the main regional centres it was important that the airports in Beira, Quelimane and Tete be renovated and upgraded.

JC Rating – Partly satisfactory 

EQ 1 Overall Rating –Satisfactory

The project is aligned with MFA/Danida development policies and strategies (to reduce poverty and increase regional development and economic growth) although, given that this is tied aid aimed at involvement of Danish firms the claimed '*involvement of (national) private sector in implementation*' must be taken to be refer to potential sub-contracting of some components of the project. There is also alignment with national development policies and strategies (i.e. PARPA) in general terms in support to national economic development rather than in support of identified focal sectors/pillars. Although there is no specific reference to PPF Danida financed pre-appraisal, appraisal and preparation studies.. Direct development impacts identified at appraisal included time savings and local/regional economic development with indirect benefits including employment opportunities, development of local businesses and tourism and increased land values - at the time there was also noted contribution to the huge investments in the Moatize coalfields in Tete.


EQ 2 -Coherence | To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?

JC 2.1 Systematic research for coherence with MFA development policies and strategy

The project was considered to be in accordance with Danida's overall development aim to reduce poverty by increasing regional development and economic growth in the three project areas at Beira, Quelimane and Tete. The airport projects would contribute to the support of economic development as increased passenger numbers generate additional income to local businesses, suppliers, restaurants and hotels. Furthermore, employment would be generated both as part of the direct project implementation and also through additional services to be supplied in the airport. The project was expected to be in line with Danida requirements concerning the environment. The main elements of the project were replacements for already existing infrastructure or equipment. While the project would support increased use of airspace and air travel, the direct impacts were on communities already adjusted to the visual and aural intrusion.

However, the applicable Danish Country Strategy was 'Strategy for Development Cooperation between Denmark and Mozambique 2000 – 2004' which had focal sectors: small scale agriculture, regional health, energy, M/E financial support, human rights and democracy, PSD and environment. Under the previous 1995 – 1999 Strategy for Danish Bilateral Cooperation 'Airports' was identified as a sector to be explicitly phased out.

While the project met DSIF's eligibility criteria and helped in a limited way to reduce rural poverty in Mozambique, airports were not a target sector in the country strategy in place at approval and had been explicitly excluded in the previous strategy.

JC Rating – Partly satisfactory 

JC 2.2 Synergies /complementarity with other Danish development initiatives

At the time of project preparation donor assistance to the aviation sectors had not taken place for some years and the Mozambique Airport Study (MAS) from 1998 financed by African Development Bank was the latest contribution. Sida and Danida assisted the domestic airports for rehabilitation in 1984, 1986 and 1992 respectively and some of

the equipment inspected at the three airports during Appraisal in 2005 (operational although obsolete) could be clearly identified as having been installed at these.

At the time of project preparation the Danish Country Strategy was 'Strategy for Development Cooperation between Denmark and Mozambique 2000 – 2004' which had focal sectors: small scale agriculture, regional health, energy, M/E financial support, human rights and democracy, PSD and environment. The succeeding strategy 'Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011) had focal sectors: agriculture, environment and health.

While the project met DSIF's eligibility criteria and helped in a limited way to reduce rural poverty in Mozambique, airports were not a target sector in the country strategy. Synergies /complementarity with other Danish development initiatives were therefore limited.

JC Rating – Partly satisfactory 

JC 2.3 Danish business links with beneficiary countries

Potential Danish business links were considered at Appraisal Stage.

While it was believed that there could be several Danish suppliers of equipment who would be interested in undertaking supply and installation of the required equipment, it was questionable how many Danish civil work contractors would be interested to undertake (relatively small) civil works in three different locations in Mozambique, when they are not established in the country. To accommodate for this, it was expected that the successful Danish supplier would enter into a sub-contract with a local/regional civil works contractor for these works. This would allow for the entire supply contract and responsibility to be maintained with the Danish supplier.

It was a condition for support from Danida that:

- The tender evaluation and the commercial contracts were approved by Danida and;
- The training components in the commercial contracts were approved by Danida.

At Appraisal an estimate was made of potential Danish content within the investment as set out below. Costs include overheads, insurance, commissioning, transportation, installation, spare parts and training in the use of equipment. All civil and building works was given a Danish component of 15% assumed to cover management, administration (partly only) and overhead + profit, while almost all equipment was given a Danish component of 100%. Engineering has been considered to be 100% Danish, while the contingencies were given the same Danish component as the resulting component of the total construction work.

Possible Danish Content



	<i>Cost</i>	<i>Potential Danish Content</i>	<i>TOTAL Danish potential</i>	
	(US\$)		(US\$)	DKK
Equipment	7.983.000	50-100%	6.690.000	42.100.000
Civil Works	6.480.000	15%	972.000	6.100.000
Buildings/Walls	2.871.000	15%	471.000	3.000.000
Total	17.334.000		8.133.000	51.200.000
Design & Contingencies	3.467.000	50%	1.735.000	10.900.000
20%				
Total	20.801.000		9.868.000	62.100.000



Source: Appraisal

At Appraisal stage it was considered that although there could be several Danish suppliers who would be interested in undertaking supply and installation of the required equipment, it is questionable how many Danish civil work contractors would be interested in undertaking (relatively small) works in three different locations in Mozambique, when they were not established in the country. To accommodate for this facet it expected that the successful Danish supplier enter into a sub-contract with a local/regional civil works contractor for these works so as to allow for the entire supply contract and responsibility be maintained with the Danish supplier.

After tendering procedures in 2005/2006 contract implementation commenced in February 2008 with a 17 month contract period. The contract was awarded to JV E. Pihl & Son A/S with Semco Maritime – although this implied a higher proportion of contract value to Danish firms, from the documentation scrutinised it is not possible to confirm these figures. The pavement works were sub-contracted to CMC and these works were rejected on quality grounds and thus were the cause of considerable contract disputes leading to considerable time over-run, multiple claims and counter-claims and eventually the work being re-done by the main contractor¹⁰⁶. The works were finalised in 2011 with hand-over in 2013. Some of the works have suffered from wear and tear over the years since completion (e.g. security fencing, drainage) but during this period Beira has suffered three major cyclones which have caused major structural damage in the Beira area.

¹⁰⁶ The main source of complaint was the quality of asphalt pavement works at Beira which were rejected on quality grounds (and a reported risk of aqua-planing for landing aircraft). After considerable argument and considerable delays, forensic investigation showed falsification of site and lab testing together with measurement and valuation anomalies. After termination of the CMC sub-contract remedial and replacement works (of acceptable quality) were successfully undertaken by Danish contractor E Pihl & Sons importing their own equipment and personnel. This outcome is unlikely to have been profitable for the Danish main contractor

JC Rating – Partly satisfactory 
<p>EQ 2 Overall Rating – Partly satisfactory </p> <p>While the project met DSIF's eligibility criteria and helped in a limited way to reduce rural poverty in Mozambique, airports were not a target sector in the country strategy in place at approval and had been explicitly excluded in the previous strategy. Estimates were made of the proportion of project value that could accrue to Danish firms – these estimates assumed that these proportions would arise more from provision and installation of equipment rather than civil works which were assumed to be sub-contracted.</p>

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>At appraisal stage financial additionality was considered in provision of more favourable repayment conditions on loans for financing of Danish supplies of capital equipment and services for a project in Mozambique. Support to the projects was given in accordance with the overall objectives and policies for Denmark's development assistance, and within the OECD consensus rules. The grant element would have to be 50% or about US\$ 10,4 million. The financial additionality is principally in the form of concessional funding and grants, which were important given the negative financial rate of return that was demonstrated by the financial analysis that was included in the appraisal study. The primary reason for the lack of financial viability is that tariffs, in the short to medium term, could not cover operating costs. Since the project was not financially viable commercial finance was not possible.</p> <p>JC Rating – Satisfactory </p>	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
<p>Danida undertook a pre-appraisal¹⁰⁷ of the project proposal in August 2005 to assess the existing documentation, collect additional project information and to undertake an overall assessment of the suitability of the project for mixed credit financing. At this time the investment was re-estimated at US\$ 15 million at 2005 prices. Following the positive findings of the pre-appraisal assessment a full appraisal was undertaken. The appraisal was undertaken in the second semester of 2005 studying relevant background documents and making extensive use of the pre-Appraisal report plus discussions with relevant authorities, institutions and airlines in Mozambique. The Appraisal Report was completed in November 2005¹⁰⁸. This provision of consultancy expertise contributed to the technical value of the project and represents DSIF non-financial additionality.</p> <p>It was a condition for Danida support that ADM carried out an EIA in line with Mozambique national legislation i.e. ADM would have to undertake a full environmental impact assessment (EIA) in conformity with recently established Mozambique guidelines. ADM expects to initiate scoping for the EIA before the end of September 2005 and to complete the EI and obtain approval for the project before the end of Q1 2006. The EIA was expected to address issues during construction as well as during operation including cross-cutting issues such as gender and HIV/AIDS concerns as well as occupational health aspects. Danida approval of the project would be subject to a duly approved environmental management plan.</p> <p>The project included TA to ADM although this TA support was more technical than regarding corporate governance and at Appraisal Stage recommendations were made on such TA.</p> <p>Specific training for all the equipment installed will be provided within the scope of the procurement and no further assistance was judged necessary by the appraisal team (and ADM staff from all three airports reported the effectiveness of this training) .</p> <p>In order to support the smooth implementation of the investment the Appraisal team consider that a focused technical assistance support package will be beneficial as follows:</p> <ul style="list-style-type: none"> • For tender preparation, evaluation, supervision and monitoring/audit • Short-term technical assistance could be considered for audit, update and training in safety and security procedures at airports in order to enhance the safe operation of the airports. <p>The field visit found that DSIF additionality as perceived by ADM;</p> <ul style="list-style-type: none"> • DSIF very good to work with • Well-coordinated cooperation between ADM and DSIF (joint decision making) • Construction contract arrangements (consultant, contractor, fiscal) worked well (despite contractual complications) • Prompt decision making by DSIF <p>JC Rating - Satisfactory </p>	
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	
Funding was only DSIF – no other finance source was mobilised.	

¹⁰⁷ Pre-Appraisal of Domestic Airports in Mozambique Draft Report, September 2005, COWI

¹⁰⁸ Final Report, Appraisal, Domestic airports in Mozambique, November 2005 Jacobs Consultancy Ltd

JC Rating – N/A

EQ 5 Overall Rating – Satisfactory 

DSIF support enabled the project to go ahead and there was clear financial additionality. The project was found to be commercially non-viable (not that commercial non-viability was by then a requirement for LDC countries) but, subject to a grant element of about 50%, the project would be viable for a 15-year investment period (estimated EIRR 9,9%). There was non-financial additionality arising from Danida financing of project preparation, technical assistance, training and support to implementation – this latter component was particularly important in dealing with the contractual complications noted above. There were no sources of financing other than by DSIF.

EQ 6 - Effectiveness

What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?

JC 6.1 Satisfactory implementation of infrastructure projects

Verification Report (Prepared by Isavia) May 2011 - Technical Assistance by Isavia to review and verify the implementation of rehabilitation at the airports: Beira, Quilemane And Tete In Mozambique
Infrastructure, equipment and relevant contractual documentation related to the following Contract Works were inspected:

Beira airport:

- Runways, taxiways and aprons
- Airfield markings
- Fire Fighting Vehicles and Rescue Equipment
- Water tank
- Perimeter fence and road.

Tete airport (Verification of documents without physical inspection):

- Fire Fighting Vehicles and Rescue Equipment
- Water tank

Quelimane airport:

- Runways, taxiways and aprons
- Airfield markings
- Fire Fighting Vehicles and Rescue Equipment
- Water tank
- Perimeter fence and road.

The result of the verification was that the Contractor had completed all of the major parts of the Works above. Some minor parts were remaining and under work processing. It was agreed with the Resident Engineer that a list of these minor works would be prepared with completion date for each part, which would be signed for at completion by the Employer. Isavia received draft lists of this remaining work from the Resident Engineer which was in the process of approval by the Employer. It was recommended that Resident Engineer and Danida follow up on this matter. With this conclusion and completion it was considered that *'both infrastructure and equipment of high quality had been constructed and delivered under this Contract, which would serve the air transportation system in Mozambique for many years to come'*.

A Quality Certificate was issued by Isavia dated 10/10/2011

JC Rating - Satisfactory 

JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)

While the outputs of the investment could be readily assessed through reports on equipment and infrastructure condition and airport operations, measure of outcomes would be more difficult to measure. These outcomes include improvement of regional development in terms of improved administration, increased tourism and business development.

Outcome-related indicators:

- Financial performance of the airports (revenue and expenditure annual statements including maintenance expenditure and investments)
- Passengers and aircraft throughout (month/annual totals by relevant categories)
- Quality of services including 'timely attention' and efficiency for safety related staff operations (incl. level of passenger/airline satisfaction, independent surveys)


The project is in accordance with Danida's overall development aim to reduce poverty by increasing regional development and economic growth in the three project areas at Beira, Quelimane and Tete. The airport projects were considered to contribute to the support of economic development as increased passenger numbers generate additional income to local businesses, suppliers, restaurants and hotels. Furthermore, employment would be generated both as part of the direct project implementation and also through additional services to be supplied in the airport and visitors in the nearby regions.

While the outputs of the investment could be assessed through reports on equipment and infrastructure condition and airport operations, measure of outcomes is more difficult to measure. Identified outcomes included improvement of regional development in terms of improved administration, increased tourism and business development. It was the responsibility of ADM to provide the necessary data needed to verify the outcome and output indicators over a 5 year period post implementation and it was suggested that these were likely to be best delivered through an independent external audit of the airport operations commissioned annually by ADM. However, no such reporting by ADM appears to have taken place. Meanwhile there has been rapid economic development in Tete (due to development of the coal reserves at Moatize and associated services) as may be seen from the huge increases of passengers and aircraft movements in Tete, some development to a lesser extent in Beira (which has suffered from the effects of three major cyclones in the same period) whilst expected tourism development (especially at Quelimane) has been less than expected.

It has been possible to cross-check the projections of growth of air traffic at each airport used at appraisal stage for economic justification for the project:

	<i>Actual (Source: ADM)</i>			<i>Projected at Appraisal</i>		<i>Actual (Source: INE)</i>		<i>Actual% increase 2004/2019</i>	<i>% increase actual 2019 /projected 2015</i>
	<i>1995</i>	<i>2000</i>	<i>2004</i>	<i>2010</i>	<i>2015</i>	<i>2016</i>	<i>2019</i>		
Passengers									
Beira	110.145	152.101	168.394	295.505	334.337	222.000	261.000	+55%	-22%
Quelimane	32.291	44.048	51.495	90.940	102.891	71.000	69.000	+34%	-32%
Tete	17.114	19.284	23.768	35.688	40.378	132.000	100.000	*320%	+148%
Aircraft movements									
Beira	6.568	9.000	7.694	8.690	9.595	8.492	9.598	+25%	0%
Quelimane	3.456	2.039	2.073	2.761	3.049	1.823	1.925	-7%	-37%
Tete	1.507	1.263	1.614	2.007	2.216	4.969	4.882	+202%	+120%
Cargo & mail									
Beira	771	3.086	927	1.111	1.197	729	19.55	+111%	+63%
Quelimane	154	273	384	391	421	460	580	+51%	+38%
Tete	234	171	236	307	331	544	545	+131%	+65%

All airports have demonstrated a significant increase in passenger numbers, movement of cargo and mail whilst aircraft movements have increased to a lesser extent thus supporting the project assumption that the investments would enable the use of larger aircraft (albeit that projected figures for passengers and aircraft movements for Quelimane and Beira as used in estimates of economic viability have turned out to be optimistic). On the other hand Tete has recorded large increases across all criteria, exceeding projections.

JC Rating - Satisfactory 

JC 6.3 Environmental, social and governance (ESG) risk management

It was a precondition for Danida support that an EIA compliant with national environmental legislation was undertaken by ADM.

National Requirements

As part of the Mozambique Airport Study in 1998, a broad Environmental Assessment was made of each airport to meet the requirements of the African Development Bank. ADM were expected to undertake a full environmental impact assessment (EIA) in conformity with recently established Mozambique guidelines. ADM was expected to initiate scoping for the EIA before the end of September 2005 and to complete the EIA and obtain approval for the project before the end of Q1 2006.

The EIA addressed issues during construction as well as during operation including cross-cutting issues such as gender and HIV/AIDS concerns as well as occupational health aspects.

Danida approval of the project was subject to a duly approved environmental management plan

Airport Internal Infrastructure

Overlay of runways, taxiways and aprons required production of asphalt concrete most of which was aggregates quarried and mixed locally with bitumen imported from South Africa. Negative environmental effects identified included:

- Exhaust emission from trucks transporting asphalt concrete from plant to airport¹⁰⁹
- Noise from transport of asphalt concrete from plant to airport
- Emission of dust from asphalt plant
- Possible ground pollution from spillage of bitumen

A full environmental management plan for the construction phase was required with suitable mitigation measures. Positive environmental effects include primarily improved safety, which means reduced risk of accidents with consequential contamination from spillage, etc. Precipitation and run-off from paved areas will be unchanged.

Airport Equipment and Facilities


Installation of new visual and navigational aids as well as security equipment in terminals was considered unlikely to have any negative impact on the environment. It would however increase safety, which means reduced risk of accidents and consequential environmental contamination from spillage, etc.

Increased water supply to the airports means increased consumption of water resources but this should not be detrimental to existing consumers outside the airports.

Installation of airport perimeter fencing was intended to prevent the unauthorised access into the airport area by people, animals and vehicles. This would enhance safe operation. As the airports have been in existence for many years, established footpaths currently avoid the airport facilities¹¹⁰.

No ESG monitoring reports have been scrutinised by the evaluation and there is no reference to environmental issues in Verification Reports. The only reference to gender as a cross-cutting issue was that the EIA would cover gender (together with HIV/AIDS and occupational health issues) during construction and operation. However, it was considered that: *The project is unlikely to be discriminatory between men and women and should be able to provide equal opportunities for improvements in living condition. A large proportion of female air travellers were observed during the field visits. The project is also considered to be neutral with regard to promotion of democratic and human rights. To the extent that it promotes and secures more rapid travel around the country it encourages national cohesion and effective administration.*

During the field visits some modest negative ESG aspects were noted which have arisen due to deterioration of the situation on the ground resulting from damage and erosion caused by the cyclones at Beira i.e.. erosion and drainage problems, damage to perimeter security fencing

JC Rating – Satisfactory 

JC 6.4 Contribution to climate change mitigation, green and inclusive development

There is no reference to climate change mitigation, greenhouse gases, etc. The only reference to emissions refers to exhaust emissions from trucks during construction and dust emissions from the asphalt plant. There is no reference to such issues as might be expected to arise from airport activities and aircraft movement. No ex-ante/ex-post comparisons have been scrutinised by the evaluation.

JC Rating – Partly satisfactory 

JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

The project was approved 14 years before the Helsinki Principles for carbon and climate resilient growth. It is accepted that the airports were already operational and thus there are certain emissions 'built in' to the continuing operation of the airports albeit that the project outputs could facilitate growth of air traffic. Although there is passing reference to Tete airport thus offering better services which could benefit the huge investments in coal extraction at Moatize it is not considered that this project's outputs would perceptibly increase such increased coal burning as such..

JC Rating – N/A

EQ 6 Overall Rating – Partly Satisfactory


Some assessment was made of expected outcomes although the outcome-related indicators refer only to airport operations and financial performance (none of which appear to have been reported upon after handover). Indirect outcomes were assumed to accrue from local and regional economic development resulting from increased airport usage and passenger numbers. Economic analysis considered benefits of regional economic development and increased employment.

While the outputs of the investment could be assessed through reports on equipment and infrastructure condition and airport operations, measure of outcomes were recognised as being more difficult to measure. Identified

¹⁰⁹ It is understood that asphalt was transported from the CMC facilities at Dondo, approximately 25km from Beira airport

¹¹⁰ This assumption is only partly accepted in that access to the airport by local farmers has been an issue before and after project implementation (some farmers actually raise crops inside the airport perimeter) and there are reports of perimeter fencing being removed to continue such access. Also, some fencing was damaged due to flooding and erosion resulting from various cyclones (especially Idai) and not all such damaged sections have been repaired.


outcomes included improvement of regional development in terms of improved administration, increased tourism and business development. There has been rapid economic development in Tete (due to development of the coal reserves at Moatize and associated services) as may be seen from the huge increases of passengers and aircraft movements in Tete, some development to a lesser extent in Beira (which has suffered from the effects of three major cyclones in the same period) whilst expected tourism development has been less than expected¹¹¹. No formal ex-ante/ex-post comparisons have been examined by the evaluation but during the field visits some ESG aspects were noted which have arisen due to deterioration of the situation on the ground resulting from damage and erosion caused by the cyclones at Beira i.e. erosion and drainage problems, damage to perimeter security fencing

EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes (using DAC definition of impact)	
<p>While the outputs of the investment could be readily assessed through reports on equipment and infrastructure condition and airport operations, it was suggested that outcomes would be more difficult to measure. These outcomes include improvement of regional development in terms of improved administration, increased tourism and business development and it was expected that the airport projects would contribute to the support of economic development as increased passenger numbers generate additional income to local businesses, suppliers, restaurants and hotels. Furthermore, employment will be generated both as part of the direct project implementation and also through additional services to be supplied in the airport and visitors in nearby regions.</p> <p>Specified outcome-related indicators:</p> <ul style="list-style-type: none"> • Financial performance of the airports (revenue and expenditure annual statements including maintenance expenditure and investments) • Passengers and aircraft throughout (month/annual totals by relevant categories) • Quality of services including 'timely attention' and efficiency for safety related staff operations (incl. level of passenger/airline satisfaction, independent surveys) <p>Economic analysis considers employment and economic development regionally.</p> <ul style="list-style-type: none"> • The incremental costs and benefits that will result from this investment. Primarily, these will focus on the impact on regional employment and economic development. <p>It was the responsibility of ADM to provide the necessary data needed to verify the outcome and output indicators over a 5 year period post implementation. However, no such reporting by ADM appears to have taken place. Meanwhile there has been rapid economic development in Tete (due to development of the coal reserves at Moatize and associated services) as may be seen from the huge increases of passengers and aircraft movements in Tete, some development to a lesser extent in Beira (which has suffered from the effects of three major cyclones in the same period) whilst expected tourism development (especially at Quelimane) has been less than expected. Research by Particip combined with the field visit showed that there was a significant increase in passenger numbers (see table in JC6.2), movement of cargo and mail whilst aircraft movements have increased to a lesser extent thus supporting the project assumption that the investments would enable the use of larger aircraft (albeit that projected figures for Quelimane and Beira have turned out to be optimistic). On the other hand Tete has recorded very large increases across all criteria. It may thus be argued that this DSIF investment fulfilled its objectives in ensuring such operations for the past 15 years</p> <p>JC Rating –Satisfactory </p>	
JC 7.2 Strong ESG performance of DSIF projects	
<p>As part of the Mozambique Airport Study in 1998, a broad Environmental Assessment was made of each airport to meet the requirements of the African Development Bank. ADM were expected to undertake a full environmental impact assessment (EIA) in conformity with recently established Mozambique guidelines. The EIA addressed issues during construction as well as during operation including cross-cutting issues such as gender and HIV/AIDS concerns as well as occupational health aspects.</p> <p>The investment supported the future development of the airports and the continued increase in aircraft usage and air travel. Given that the airports were to remain operational then the aim was to provide their service with the minimum impact and maximum safety. Most of the project elements in the current investment proposal relate to the replacement or repair of existing facilities. To this extent the environmental impacts are primarily related to the construction and installation phase.</p> <p>Overlay of runways, taxiways and aprons required production of asphalt concrete most of which was aggregates quarried and mixed locally with bitumen imported from South Africa. Negative environmental effects identified for the implementation period included:</p> <ul style="list-style-type: none"> • Exhaust emission from trucks transporting asphalt concrete from plant to airport • Noise from transport of asphalt concrete from plant to airport • Emission of dust from asphalt plant 	

¹¹¹ Tourism potential that was considered included for Beira: proximity to Gorongosa national park; for Tete: hunting areas based on community tourism, business tourism from the Moatize mines) and Cahora Bassa dam/lake; Quelimane was characterised as 'a quaint fishing town and port'

- Possible ground pollution from spillage of bitumen

Installation of new visual and navigational aids as well as security equipment in terminals was considered unlikely to have any negative impact on the environment. It would however increase safety, which means reduced risk of accidents and consequential environmental contamination from spillage. Increased water supply to the airports means increased consumption of water resources but this has not been considered to be detrimental to existing consumers outside the airports. Installation of airport perimeter fencing was intended to prevent the unauthorised access into the airport area by people, animals and vehicles. The project was considered unlikely to be discriminatory between men and women and able to provide equal opportunities for improvements in living condition. A large proportion of female air travellers were observed during the field visits. The project is also considered to be neutral with regard to promotion of democratic and human rights. To the extent that it promotes and secures more rapid travel around the country it encourages national cohesion and effective administration. No ESG monitoring reports have been scrutinised by the evaluation and there is no reference to environmental issues in Verification Reports (the only reference to gender as a cross-cutting issue in the VRs was that the EIA would cover gender (together with HIV/AIDS and occupational health issues) during construction and operation). During the field visits some ESG aspects were noted which have arisen due to deterioration of the situation on the ground resulting from damage and erosion caused by the cyclones at Beira i.e. erosion and drainage problems, damage to perimeter security fencing

JC Rating – Satisfactory 

JC 7.3 Satisfactory financial returns and portfolio performance

The project, whether considered at the level of the individual airport or as a whole, was found to be unlikely to be financially/commercially viable. The projected net cash-flow would not be sufficient to repay a commercial loan over a period of 10 years and consequently financial assistance from ADM and/or the GoM would be required. Nevertheless, if a concessionary loan over 15 years was to be made available there is a good chance that it could be repaid from the enhanced surpluses of the three airports although it was recognised that there was a risk that insufficient funds will be allocated for operation and maintenance of the airports considering the weak financial performance of ADM and the demands for investment at other airports.

The ability of the three airports to repay the loan unassisted was considered marginal even over an extended 15 year period. Any increase in capital costs or slower than expected increase in traffic would further confirm this broad conclusion regarding financial non-viability.

Based upon the financial results for 2002 – 2004¹¹² financial forecasts were made for the three airports from 2004 to 2027 and estimates of FIRR and NPV were made as follows:

<i>Airport</i>	<i>FIRR</i>	<i>NPV</i>
Beira	6,04%	40.232
Quelimane	2,26%	-
		1.688.275
Tete	-10,67%	-
		3.355.315

A Particip comparison of the 2015 forecast passenger and freight volumes for the three airports with actual volumes for 2019 (the most recent available) taken from 6.2 is shown below¹¹³:

Comparison 2015 Project Airport Volumes and 2019 Actuals			
	<i>Appraisal forecast 2015</i>	<i>Actual 2019</i>	<i>Excess/ Shortfall 2019 / 2015</i>
Passengers			
Beira	334.337	261.000	-22%
Quelimane	102.891	69.000	-32%
Tete	40.378	100.000	+148%
Aircraft movements			
Beira	9.595	9.598	0%
Quelimane	3.049	1.925	-37%

¹¹² ADM Financial Reports

¹¹³ If the forecasts in the appraisal had continued to 2019 then they would most probably have been higher.

Tete	2.216	4.882	+120%
Cargo & mail			
Beira	1.197	1.955	+63%
Quelimane	421	580	+38%
Tete	331	545	+65%
Source: Appraisal and Particip analysis ADM reports			

While passenger numbers overall fell short of the 2015 forecast (due to the fact that Beira handles about two thirds), aircraft movements were broadly in line. Cargo and mail exceeded forecasts. Financial data on the performance of the three airports is not, however, available. Nevertheless, the field visits indicated that overall utilisation at the airports was low, indicating that they were probably loss making.

JC Rating – Partly satisfactory 

EQ 7 Overall Rating – Partly Satisfactory


The overall economic assessment (see below also) found the investment to be financially non-viable but economically viable (EIRR 9,9% over 25 years). If assumptions are fulfilled then the project was judged to be institutionally, technically and financially sustainable. From figures available it appears that the degree of financial non-viability was underestimated as projected airport movements (passengers and aircraft movements) was over-estimated at appraisal stage

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>The economic analysis focused on two aspects:</p> <ul style="list-style-type: none"> • The benefits from the operation of an airport in a safe manner for aircraft up to B737-200. Operation of a small-scale airport in each Province in Mozambique was an essential requirement for national security and development. As the airports were to be used by mid-sized commercial aircraft they had to be equipped to a minimum approved standard. This was the basic criteria used when assessing the content of this investment project, and • The incremental costs and benefits that resulted from this investment. Primarily focus on the impact on regional employment and economic development. <p>The three airports were then used by aircraft up to B737-200. The safe operation of aircraft up to this size requires an internationally defined level of security particularly in relation to fire cover. This is in addition to the general safe operation of communications systems, navigational aids and lighting, runways and other operational aspects of the airport.</p> <p>To assess the likely scale of impact of the proposed minimum safety investment the Appraisal considered the effect of downgrading the airports to the use of smaller, 30-seater Embraer 120 aircraft rather than the 110-seater B737 aircraft which currently were used. While there might be more direct flights the cost per passenger trip was considered as unlikely to be higher using smaller aircraft.</p> <p>The forecast traffic through the three airports, including embarking and transit passengers, provided a measure of those likely to be affected by the operational changes (although actual traffic figures show that such projections were over-estimated for Beira and Quelimane airports whilst being seriously underestimated for Tete airport (– see above). Two adjustments were made to the forecast passenger figure in this assessment:</p> <ul style="list-style-type: none"> • To exclude those who already or who might be expected to travel in smaller aircraft in any event, and • To avoid double counting of passengers travelling between the three airports. <p>The number of travellers by B737 and in smaller aircraft was estimated from ADM data. It was assumed that in the future an increased proportion of travellers would travel in larger aircraft (this assumption is borne out by actual traffic figures (passengers and aircraft movements).</p> <p>The economic development impact focussed on the costs and benefits that could result from the project such as:</p> <ul style="list-style-type: none"> • Time savings within the airport (improved facilities at peak hours) • Time savings compared to alternative means of transport (road, rail, etc) • Local and regional economic development (job generation, increased activities both inside and outside the airports) • Local and regional consumption by air passengers including lodging, local transportation and retail purchases • Induced impacts including activities of suppliers to the businesses at the airports (office supplies, fuel, spare parts, etc.) <p>As congestion was unlikely to be encountered in either the airside and/or landside over the forecast period time savings for users likely to be small and were not considered further.</p> <p>Wider development benefits considered included:</p> <ul style="list-style-type: none"> • Improvement of living conditions for the populations • Development of small local enterprises and other commercial activities • Employment opportunities generated from airport activities • Increases in value of land 	

Although the economic benefits were difficult to quantify, an indication was also made of some of the net benefits that might be generated from the investments such as employment during rehabilitation, increased tourism and business activities including employment. The analysis of the likely net benefits based on estimates of salary levels, scope of employment and value of tourism and business. In the event the expected growth of tourism has not occurred whilst development of the Tete area has been driven by the huge investments in the development of the Moatize coal fields which is reflected in the very high traffic growth (of company aircraft) reported for Tete airport (compared with Beira and Quelimane airports).

The economic rate of return for the overall investment was estimated at 9,9% over a 15-year period. Approximately two thirds of the benefits arise from the ability to avoid having to close the airports to larger aircraft and one third to the quantified regional development benefits.

The avoidance of downgrading of the airports and the potential for enhanced regional economic development indicated that the airport investments could be considered economically viable. Additional impacts such as increased national security, improved potential for business, improved potential for efficient administration would all contribute unquantified benefits for the securing of commercial air services at the three airports.

JC Rating – Partly Satisfactory 

JC 8.2 Level of commercial/financial viability of infrastructure

A detailed Financial Assessment was done at Appraisal Stage – the investment return is found to be marginal at best. Beira Airport –Recorded passenger numbers over the 10 year period were less than projected (approximately 66% see table in JC 7.2) and over an approximate 15 year period were also less than projected (approximately 78%) such that the estimated cash surplus is less than expected thus casting doubt upon the anticipated ability to repay a concessionary loan over 15 years.

Quelimane Airport - Recorded passenger numbers over the 10 year period were less than projected (approximately 69% see table in JC 7.2) and over an approximate 15 year period were also less than projected (approximately 67%) such that the estimated cash surplus is less than expected thus casting doubt upon the anticipated ability to repay a concessionary loan over 15 years.

Tete Airport - In contrast to the other airports recorded passenger numbers over the 10 year period were greater than projected (approximately 326% see table in JC 7.2) and over an approximate 15 year period were also greater than projected (approximately 247%) such that the estimated cash surplus is considerably more than expected thus suggesting a better than expected ability to repay a concessionary loan over 15 years.

Overall the commercial performance is not likely to have resulted in any of the three airports being financially viable.

JC Rating – Partly Satisfactory 

JC 8.3 Level of improvements in ESG achievement

The EIA addressed issues during construction as well as during operation including cross-cutting issues such as gender and HIV/AIDS concerns as well as occupational health aspects.

The investment supported the future development of the airports and the continued increase in aircraft usage and air travel. Given that the airports were to remain operational then the aim was to provide their service with the minimum impact and maximum safety. Most of the project elements relate to the replacement or repair of existing facilities. To this extent the environmental impacts are primarily related to the construction and installation phase. Installation of new visual and navigational aids as well as security equipment in terminals was considered unlikely to have any negative impact on the environment. It would however increase safety, which means reduced risk of accidents and consequential environmental contamination from spillage. Increased water supply to the airports means increased consumption of water resources but this has not been considered to be detrimental to existing consumers outside the airports. Installation of airport perimeter fencing was intended to prevent the unauthorised access into the airport area by people, animals and vehicles. The project was considered unlikely to be discriminatory between men and women and able to provide equal opportunities for improvements in living condition. A large proportion of female air travellers were observed during the field visits. The project is also considered to be neutral with regard to promotion of democratic and human rights. To the extent that it promotes and secures more rapid travel around the country it encourages national cohesion and effective administration. No ESG monitoring reports have been scrutinised and there is little reference to environmental issues in Verification Reports. During the field visits some ESG aspects were noted which have arisen due to deterioration of the situation on the ground resulting from damage and erosion caused by the cyclones at Beira i.e. erosion and drainage problems, damage to perimeter security fencing

JC Rating – Partly satisfactory 

EQ 8 Overall Rating - Partly Satisfactory


Although the economic benefits were difficult to quantify, an indication was also made of some of the net benefits that might be generated from the investments such as employment during rehabilitation, increased tourism and business activities including employment. In the event the expected growth of tourism has not occurred whilst development of the Tete area has been driven by the huge investments in the development of the Moatize coal fields which is reflected in the very high traffic growth reported for Tete airport (compared with Beira and Quelimane airports). Approximately two thirds of the benefits arise from the ability to avoid having to close the airports to larger aircraft and one third to the quantified regional development benefits. The avoidance of downgrading of the airports and the potential for enhanced regional economic development indicated that the airport investments could be considered economically viable. Additional impacts such as increased national

security, improved potential for business, improved potential for efficient administration would all contribute unquantified benefits for the securing of commercial air services at the three airports.


Performance at the three airports varied, with the biggest, Beira, having lower than planned passenger numbers while Tete has moved from third to second in passengers.


Whilst the project was not expected to be detrimental as regards pollution and emissions compared with the no-project scenario, the EIA did not consider airport operations or aircraft movements. A central tenet of the project was to ensure continuing use of 737 aircraft rather than smaller Embraer services with direct benefits concentrating on time saved, local/regional development and increased business activities linked to the airports. Relative increases in operational emissions, noise can be assumed.. The EIA addressed issues during construction as well as during operation including cross-cutting issues such as gender and HIV/AIDS concerns as well as occupational health aspects.

The investment supported the future development of the airports and the continued increase in aircraft usage and air travel. Given that the airports were to remain operational then the aim was to provide their service with the minimum impact and maximum safety. Most of the project elements relate to the replacement or repair of existing facilities. To this extent the environmental impacts are primarily related to the construction and installation phase.

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
JC 10.1 Quality of risk management systems and policies on long-term sustainability	
<p>Assumptions and risks were identified at Appraisal Stage noting that ‘All of these risks could be mitigated with suitable contingency planning’.</p> <ul style="list-style-type: none"> • ADM local capacity to handle project implementation • Significant uncertainty over the traffic growth forecasts. • Insufficient funds would be allocated for operation and maintenance of the airports considering the present weak financial performance of ADM investment at other airports. • Airports and equipment is not operated in accordance with international standards <p>As confirmed by the field visit, the identified risks were valid. As regards project organisation the implementation problems arose more from the (sub)contracting arrangements than ADM capacity issues whilst as regards market conditions traffic figures (passengers and aircraft movement were over-estimated for Beira and Quelimane airports and considerably under-estimated for Tete. ADM continues to struggle with operating budgets but continues also to operate increasingly obsolete equipment whilst, although the project certainly improved operating safety standards ICAO certification was not obtained immediately post-implementation (and cannot now be obtained with the current state of airport equipment and infrastructure). Also communications have been reported to be a problem as the fibre optic cable connection is not operational and an alternative microwave linkage is suggested.</p> <p>JC Rating –Satisfactory </p>	
JC 10.2	M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio
<p>Monitoring indicators for outputs and outcomes were identified at Appraisal but no ex-post reporting has been scrutinised by the evaluation (except as regards ICAO certification and Verification Reports – see below): DSIF required annual reporting on the indicators identified for the project for five years after commissioning. The Appraisal considered that the indicators should include facets related to the safe operation of the airports. While the outputs of the investment can be readily assessed through reports on equipment and infrastructure condition and airport operations, measure of outcomes are more difficult to measure. These outcomes include improvement of regional development in terms of improved administration, increased tourism and business development.</p> <p>The below mentioned proposed indicators for the project are generally in compliance with the established principles for indicators under the Mixed Credit scheme as follows:</p> <p>Output-related indicators:</p> <ul style="list-style-type: none"> • Condition of overlay and sealed areas – (condition and area) • Facilities and equipment installed and operational status (relevant units) • Safety requirements (airport operational procedures, control tower procedures, maintenance procedures, security procedures, fire security and procedures, accident reports) • Person-days training provided <p>Outcome-related indicators:</p> <ul style="list-style-type: none"> • Financial performance of the airports (revenue and expenditure annual statement including maintenance expenditure and investments) • Passengers and aircraft throughout (month/annual totals by relevant categories) • Quality of services including “timely attention” and efficiency for safety-related staff operations (incl. level of passenger/airline satisfaction, independent surveys). 	




It was the responsibility of ADM to provide the necessary data needed to verify the outcome and output indicators. It was considered that these are likely to be best delivered through an independent external audit of the airport operations commissioned annually by ADM. This reporting appears not to have been carried out. However, given that development outcomes suggested in project justification included regional and business development, employment generation (both as part of the direct project implementation and also through additional services to be supplied in the airport), increased tourism, additional income to local businesses, suppliers, restaurants and hotels, improvement of living conditions for the populations, development of small local enterprises and other commercial activities and increases in value of land none of these potential outcomes are covered in specified outcome indicators.

JC Rating – Unsatisfactory 

EQ 10 Overall Rating – Partly Satisfactory 

A number of risks were identified but mitigation measures were not proposed for all such risks (e.g. to appoint TA for preparation of specifications and tender processes). Concern was expressed about the adequacy of cash flow to service loans and also about the ability to operate the airports in accordance with international standards (citing evidence of such shortcomings at appraisal stage). Given that the investments were considered to be the minimum necessary for safe operation of the airports (and were considered to be *'neither premature nor excessive'*) correct usage of the project infrastructure and equipment was essential. As mitigation it was recommended that operations should be independently reviewed but it appears that such reviews did not actually take place. Certainly the intended ICAO certification did not take place.

Monitoring indicators at output and outcome levels were specified together with requirement for annual ex-post reporting by ADM although outcome indicators did not cover any of the indirect development outcomes expected from the project. However, no reporting on the considerable contractual complications has been examined by the evaluation¹¹⁴ nor any reporting against outcome indicators.

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
No logical framework has been examined. Output and outcome indicators were specified but these refer almost entirely to the infrastructure delivered by the project and to the use made and performance of that infrastructure and equipment. The outcome indicators did not cover any expected indirect or induced outcomes. Annual reporting on the indicators identified for the project was required for five years after commissioning and ADM was responsible for providing the necessary data needed to verify the outcome and output indicators. However no monitoring reporting (other than verification reports) has been examined.	
JC Rating – Partly satisfactory 	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
Verification Reporting evaluated project works undertaken at the three airports i.e., <ul style="list-style-type: none"> • civil works • water tanks, fencing and perimeter roads • ARFF equipment installed by the contractor This reporting was upon outputs (although does not directly follow the specified output indicators noted above). There is no reporting on specified outcome indicators. A Quality Certificate was issued by ISAVIA 10/10/2011	
JC Rating – Partly Satisfactory 	
EQ 11 Overall Rating – Partly Satisfactory 	
No logical framework has been examined although output and outcome indicators were specified. These refer almost entirely to the infrastructure delivered by the project and to the use made and performance of that infrastructure and equipment. Verification Reporting evaluated project works undertaken at the three airports i.e. civil works, water tanks, fencing and perimeter roads and ARFF equipment installed by the contractor. This reporting was upon outputs (although it does not directly follow the specified output indicators) and a Quality Certificate was issued 10/10/2011. The outcome indicators did not cover any expected indirect outcomes. Annual reporting on the indicators identified for the project was required for five years after commissioning and ADM was responsible for providing the necessary data needed to verify the outcome and output indicators. However and no monitoring reporting (other than verification reports) has been examined.	

¹¹⁴ Although very informative meetings with Kenn and Gitte Jorgensen (involved in engineering supervision and contractual issues respectively) provided insight into the nature of contractual and engineering problems encountered and the solutions to these problems

Field visits and calls



13.1.1 Introduction

During the field visits (undertaken by José Chiburre, facilitated by Paulino d'Uambo) meetings were held with ADM (Aerportos de Moçambique) personnel in Maputo, Beira, Quelimane and Tete between 23/03/2021 and 29/04/2021.

The field mission took place from March 23rd to April 29th, 2021 in Maputo ADM HQ, Beira, Quelimane and Tete airports.

People met: Emanuel Chaves (CEO), António Loureiro, Celso Zualo, Ernesto Chauma See annex 1 for the full list

Places Visited: Beira, Quelimane and Tete airports.

Institutions interviewed: ADM at national at provincial levels.

13.1.2 Findings

13.1.2.1 Working with Danida

The process for accessing the funding started with the appraisal mission in 2003, when the target airports (Beira, Quelimane and Tete airports) were inspected. After the appraisal, the funding required for the rehabilitation of the three airports was estimated for the improvement the airports safety to meet the ICAO requirements, and the conversation with Danida started.

Danida responded quickly and positively to the request and there was no need to approach other potential financiers. In fact, ADM had had funding from Danida before the funding through Mixed Credits. This funding through Mixed Credits was equally good for ADM.

As soon as the funding for the project was approved, Danida got involved from the beginning of the project. Danida provided technical assistance in EIA, Laboratory (Soil) analysis and civil engineering studies, and assigned an expert to assist during the procurement and tender process. All the studies were well done and with good quality.

The Tender and contracting were done between 2005 and 2006. A Danish consortium comprising Phil&Sons and Semco was contracted to carry the necessary works. On the other end, Danida contracted a Danish Independent Fiscal (ISAVIA?) to audit and monitor the progress of the project implementation.

The project implementation started in February 2008 with the deadline of 17 months. There were some constraints and delays. Phil&Sons subcontracted CMC, a company based in Mozambique. CMC works in the airstrip of Beira airport did not meet the required specifications / standards and it was quite serious, so the work done by CMC was rejected. After discussions between ADM and Phil&Sons, with a strong intervention of Danida, the contractor agreed to redo the work, and it was not necessary to go to Court. This time the work was done by Phil&Sons.

The project was therefore finalized in May 2011. With the warranty period of two years, the definitive hand-over by the contractor was in 2013.

It was very good to work with Danida. The work was well coordinated between parties in all phases and the decisions were made jointly with Danida. The structure (contractor, independent consultant, fiscal) proposed by Danida was perfect and facilitated the work and the supervision.

The investment was used for the rehabilitation of the airstrips, communication system / control tower (radios, etc.), introduction of VHFS and MHS system, firefighting equipment (including vehicles), power generators, airstrip lighting system, water tanks and vertical signalization.

During the project implementation, there were three (03) claims from ADM and twenty-eight (28) from the contractor. All the claims were timely resolved through negotiations and compensations within the existing budget.

Despite the work which (at the end) was well done for Beira and Quelimane airport, the central region was hit by three cyclones, which damaged the airports' infrastructures, especially in Beira. The fencing that was done using metallic poles and metal fence (net) was severely damaged, and ADM currently has no financial resources rehabilitate the damaged infrastructures. ADM had proposed to build cement poles, which are stronger, but due to higher cost, it was later decided to use the metal poles.

After being hit by three cyclones (IDAI, Chalane and Loise) Beira Airport needs to be rehabilitated to meet the safety requirements. Preliminary estimated indicate that about US\$30 million is required for the rehabilitation of Beira Airport.

13.1.3 Activities and challenges per airport

13.1.3.1 Beira Airport

At Beira airport the funding supported the rehabilitation of the airstrip, three stands (areas of parking big / heavy airplanes, the boarding and disembarkation area, telecommunication / electronic equipment, radio (radio-ajuda), fencing and security, water reservoir with the capacity of 7m³ and a water pump, emergency power generator (300KVA), complete firefighting equipment, including two firefighting vehicles - one with the capacity of 6.500 litres and the other one with 1.100 litres.



Field visit photos - fencing damaged by gully erosion created by cyclones (left) and ADM efforts to replace damaged fencing (right).

Rehabilitation work and the equipment purchased by the project



From left to the right: Water reservoir and water pump, fire fighting vehicle (Rosenbauer) and power generator.



From left to right: Rehabilitated stand (left), airstrip (centre) and fencing (right)



From left to right: Control tower equipment, traffic control, alignment / localizer and signalization.

The Beira airport management confirms that most of all the equipment purchased by the project is of good quality and was the best option at the time it was purchased. Most of the equipment are still functional, except for some electronic equipment with short life span, and those damaged by the impact of the cyclones. The airstrip has small cracks, but ADM is mending them as they appear.

Beira airport received two fire fighting vehicles with equipment and spare parts which they still have on stock. The vehicles have the water capacities of 6.500 litres and 1.100 litres and are of good quality.

Just like any other vehicle, they require adequate technical assistance, which is not available in Mozambique. Relevant airport staff were locally trained in firefighting, operating the vehicles and basic maintenance, but not to the capacity to provide adequate technical assistance for the vehicle.

Additionally, the trucks have two seats, one for the driver and the other one for one passenger. It would have been better if the trucks came with three seats, for the driver and two fire fighters as they need to help each other while the driver manages the truck.

Of the two trucks the 6.500 litres capacity truck was allocated / transferred to Chimoio airport and substituted by a 12.000 litres truck. The remaining 1.100 litres is functional, but the tubes need replacement. The truck is also functioning in an uncoordinated way and there is need for calibration. With the technical assistance from Rosenbauer the problem can be easily fixed. In 2005/2006 a technician from Rosenbauer came to Mozambique and fixed all the small problems the vehicles had. The technical assistance was being provided by Entrepосто and Marcé but was not adequate.

The emergency power generator is fully operational, and it is set to start 9 seconds after the power failure, and it does.

Some problems

- The rotating beacon and signal lantern are not functional
- The alarm system at the firefighting brigade station is not functional.
- DME: One input source is not functional. ADM has ordered spare parts, but it is taking a long time to be sent to Mozambique. The faulty doesn't affect the precision determination because the other emitter / input source is functional.
- Communication Integrator: After a strong thunderstorm in 2007, the integrator has been operating with deficiency which, to some extent, affects communication. The spare parts have been ordered long ago and are expected to arrive in Mozambique mid-2021. There are also problems of communication (sending and receiving information) with other airports (see below reference connection to the fibre optic network).
- At the Control Room, the anemometer is not functional, and the manufacturer no longer makes the spare parts for that type of anemometer.

Certification

Airport certification was the main objective of the funding. However, the certification process took too much time because the Mozambican Aviation Services did not have the legislation in place and there were no conditions to move for certification. Only in 2017/2018 the certification process for the Beira airport started, and while the process was underway, the airport infrastructures were damaged by the first and the strongest cyclone (IDAI). This natural disaster affected the certification process; and now Beira airport needs to be rehabilitated again to meet the ICAO standards.

Other aspects which will also affect certification (according to the key informants at Beira airport)

- *The firefighting capacity in Beira airport:* Currently, the Beira airport has two vehicles in the firefighting brigade with the total capacity of 13.100 litres (12.000+1.100). The certification standards demand that the airport should maintain a permanent capacity of at least 12,100 litres (according to Beira Airport staff). There being only two vehicles, in case the one with 12.000 litres has a breakdown there is not enough back up to maintain the airport capacity required by ICAO standards.
- *Damaged fencing due to cyclones*
- *Lack of direct access from the firefighting brigade to the airstrip:* Certification standards require that there is direct access from the firefighting base to the airstrip – such access doesn't exist in Beira airport
- *Lack of pavement in the manoeuvring area of firefighting vehicles*
- *Lack of access from the firefighting base to the airport fencing and to all the airport gates*
- Additionally, the airstrip is not smooth enough and there is accumulation of water in the airstrip.

13.1.3.2 Tete Airport

At Tete airport the funding supported the purchase of firefighting 6.000 litres capacity Rosenbauer vehicles and a complete set of firefighting equipment, illumination of the airstrip, purchase of two emergency power generator of 220KVA each at the power centre and one of 22KVA at DVOR, installation of two transformers (one at the power centre and the other one at the Vor), installation of the most recent DVOR DNE equipment recommended by ICAO, installation of the AFTN and VHF at the control tower, construction of water reservoir and a water pump, purchase for the equipment for the Control tower (2 transmitters, 2 receivers, 2 trans receivers, consoles, windows and curtains), purchase of digital meteorological equipment (anemometer). Rehabilitation work and the equipment purchased by the project

Rehabilitation work and the equipment purchased by the project



Field visit photographs - from left to right: Two power generators (left), water reservoir (centre) and vertical signal (right)



Airstrip illumination



From left to right: Firefighting 6.000 litres capacity vehicle – Rosenbauer (left and centre) and anemometer (right)



Firefighting equipment, including Rosenbauer spare parts in the wooden box



DVOR centre and DVOR set



From left to right: DME (left) and a 22KVA power generator installed at the DVOR centre

The equipment purchased by the project has been of a paramount importance for the airport as it improved the quality of operations at Tete airport.

13.1.3.3 Some problems

Most of the equipment is still in good conditions and operational. Those items which are not functional are either because of their short life span or have slight problems which could be fixed or the problems are not related to ADM, and include:

- The monitoring of the equipment cannot be done from the control tower because of fibre optic failure (see below also).
- DVOR was installed and there have not being significant faults. There are two sets of DVOR; one is functioning while the other is on standby.
- DME has had small problems, but ADM has already ordered the spare parts. Just like DVOR, there are also two sets of DME, so for now DME is also functioning.
- For the airstrip illumination, while the light regulators are remotely operated from the control tower, the circuit-breaker is not functional since 2018
- The alarm system functions with some difficulties.
- The firefighting vehicle requires re-programming, and only the manufacturer (Rosenbauer) can do it.
- The water pump installed at the water reservoir had a break down and it was replaced with a pump of lower capacity.
- The ELN monitor is not operational because of the problems with connection to the fibre optic network. The fibre optic problem dates back to 2012/2013 (see below also)

13.1.3.4 Quelimane Airport

At Quelimane airport the funding supported the rehabilitation of the airstrip (including illumination), fencing, telecommunication / electronic equipment, water reservoir with the capacity of 6m³ and a water pump, emergency power generator, a complete firefighting equipment, including one firefighting vehicle with the capacity of 1.100 litres.

Rehabilitation work and the equipment purchased by the project



From the left to the right: Water reservoir (left) and the emergency generator (right)



Rehabilitated Airstrip

The Quelimane airport received one Rosenbauer firefighting vehicle with a capacity for 1.100 litres, and at that time the airport had a fire-fighting capacity of 5.100 litres. The vehicle was exchanged with 4.000 litres vehicles, adding to a total airport capacity to 8.000 litres, and upgrading the airport to category 6. The 1.100 litres vehicle was sent to Nacala airport and it's still operational.

13.1.3.5 Some problems

- The airstrip is in good conditions, the same with its illumination and vertical signalization. An incident happened in 2020 when an airplane over-ran the runway and damaged one of the vertical signalizations. See the figure below
- The painting on the edges of the airstrip are corroding the pavement (see the figure below).



From left to right: parts of the airstrip degraded by the paint (left) and vertical sign damaged by the plane that ran out of the airstrip in 2020.

- The drainage in the airstrip does not allow all the water to be drained out, leaving some water accumulated on the edges of the airstrip.
- Some trans receivers are no longer functional. At the control tower all the trans receivers are not functional now and were replaced by the old ones.

- The server of the remote control is not functional hence the airstrip illumination is done manually to suit the crew's demand on light. The tower beacon, which is linked to the remote system is not functional, but the signal lantern is functional. The server of the circuit-breaker alarm is also not functional (see below also).
- Due to an optical fibre failure, the extension on Frequency 127,7 MHZ is not functional
- The fencing constructed with metal poles and metal fence is damaged in some parts, and there is no access to the whole perimeter of the fencing due to water and mud. The airport management had preferred the poles were made of concrete as the surface and ground water around the airport is saline.

13.1.4 Conclusions

- All long-lasting equipment are still operational. Those with short life span, most of them are damaged
- There is no local capacity for the maintenance of the fire fighting vehicles. As the technicians from Rosenbauer (Australia) rarely come to Mozambique.
- Non-operational optic fibre has affected the way the Quelimane and Tete airports are being operated.
- Staff from three airports benefited from training in relevant fields.
- All airports are not ICAO certified. The certification process for Beira has stalled due to lack of adequate legislation and after the legislation was put in place, the cyclones damaged some infrastructures. It is clear for Beira airport to advance for certification, the damaged infrastructures should be fixed.

13.1.5 Recommendations

- The recommendations were contributions from the key informants
- Build capacity to local staff to guarantee maintenance of the fire fighting vehicle or contract Rosenbauer (the agent) to provide technician assistance, which besides providing good and adequate technical assistance, is cheaper compared to Marcé.
- Use of microwaves for transmission instead of optic fibre as the latter is not functional for long time and it is not clear when the optic fibre will be operational.

14 Mozambique: Reinforcement and Extension of National Power Transmission Grid

Overview

Key issues, highlights and lessons learnt	
<p>The project was complementary to other development partners' activities in the energy sector and with Danida's previous support to the energy sector in Mozambique. Danish firms' experience in construction of energy sector infrastructure has been recognised in project preparation Identified outcome indicators relate only to technical performance of project outputs and not to development outcomes. Analysis of risks, assumptions and mitigation measures is of high quality and in terms of issues and constraints which have arisen during implementation the analysis has been proven to be prescient albeit that proposed mitigation measures did not prevent a number of identified risks coming to pass. ESG risk management has thus been only partly effective Financial and economic analysis was undertaken at feasibility stage and subsequently updated at appraisal stage.</p> <p>The project as a whole is commercially non-viable, mainly due to low tariffs. Reporting on implementation was timely and of good quality concentrating almost exclusively on implementation activities, progress (physical and financial), outputs, quality and contractual issues. At the time of writing only commissioning of the Maputo 275kVA sub-station and the SCADA/telecom remained outstanding.</p> <p>Although contractor was JV Per Aarsleff/Seth, a significant proportion of the total contract value has accrued to non-Danish (sub-contracting) firms.</p> <p>During the field visits in March/April 2021 it was noted that EDM has a good experience of working with Danida albeit that there is a long time period between appraisal and implementation. However, once project implementation started, progress was quick and infrastructure construction was completed on time although some installation and commissioning of equipment, was only completed in April 2021 because of COVID travel restrictions. However, some defects have yet to be remedied (as demonstrated in photos below) including the SCADA /Telecom system has not yet been commissioned which is an operational issue for sub-station operators. Finally, delays in provision of transmission lines serving the Maputo 275KV sub-station (financed by KfW) have delayed sub-station operationalization</p>	




Summary	
Project name	Reinforcement and Extension of the National Power Transmission Grid
Type of project	Energy
Project No.	SBK,j.nr.104.O.30
Description	<p><u>Main Package</u> Power supply to Gaza and Inhambane provinces: 275 kV transmission line Ressano Garcia-Macia (operated at 100 kV) incl. modifications to the associated substations. 110 kV transmission line Lindela-Massinga, modifications to Lindéla substation, new 100/33 kV substation at Massinga and 33 kV line Massinga-Maxixe. Rural electrification in Homoine, Morrumbene, Chibuto and Mandjakaze districts.</p> <p><u>First optional package</u> Reinforcement of four substations in the North by installing extra transformers in each of the substations: Chimuara (1 of 16 MVA and 1 of 40 MVA), Quelimane (1 of 50/50/20 MVA), Alto Molocue (1 of 100/100/33 MVA) and Nampula 1 of 35 MVA).</p> <p><u>Second optional package</u> Power supply to Beloluane Industrial Park consisting of 2 of 120 MVA transformers and associated equipment implemented as an extension to Maputo substation.</p> <p><u>Third optional package</u> Extension of Maputo substation by one 400 MVA transformer and associated equipment – cancelled</p> <p>The project as a whole was a series of scattered interventions that met a need to improve reliability and coverage of power supply in wide areas of the country.</p>
Sector	Energy
Country	Mozambique
Sponsor	Electricidade de Moçambique ER (Guarantor and borrower MoF)
Other stakeholders	Consultant JV Norconsult/Vattenfall Power Consultant – design, tendering, supervision contract signed 2011 EDM –
Clearance in principle	

Summary					
Approval/Binding Commitment	2010	Loan / Investment Agreement Date			
Danish Bank	<u>Funded amount</u>				
		Loan	DKK 781,02 million		
		Amount	DKK 578,23 million		
		Running time	10 years		
		Grace	-		
		Total subsidy element	50% (OECD)		
	<u>Total Expenditure</u>				
			DKK million	USD million	
		Total	569,12	103,85	
		Interest rate support	127,36	23,24	
		EKF premium	68,28	12,46	
		Bank margin	6,41	1,17	
		Extra grant amount	202,92	37,03	
		Technical assistance etc	16,60	3,03	
	Budget margin 35%	147,55	26,92		
	<u>Project budget</u>				
		Total project investment	DKK 783,87 million		
		Danish contract	DKK 781,02 million		
Loan Duration + Grace Period	10 years – loan for main package signed 23/05/2013 – effective 06/08/2013				
Project Amount and funding plan	Contract amount DKK 11507172 (excluding 15% contingency) consisting of main package to be implemented first and three optional packages which may be called later (see above)				
Danish Exporter	Per Aarsleff/Seth – Contractor . Contract with EDM signed 06/02/2013				
MFA guarantee	Date		Amount		Duration
Implementation status	<p>Implementation:</p> <p>Main Package: All main components of the project have been completed with exception of telecom works which have been partially completed (QPR Q4 2020) Power supply to Gaza and Inhambane provinces:</p> <ul style="list-style-type: none"> • 275 kV transmission line Ressano Garcia- Magude - Macia incl. modifications to the Ressano Garcia substation • New 275/110/33kV substation in Ndzimbene (Macia), incl. 250 MVA autotransformer. • 110 kV transmission line Lindela-Massinga, modifications to Lindela substation. • New 110/33 kV substation at Massinga, incl. 30 MVA transformer • 33 kV line Massinga-Maxixe. • Rural electrification in Gaza and Inhambane Provinces. <p>The main package is complete</p> <p>First optional Package: All main components of the project have been completed (QPR Q4 2020) Reinforcement of four substations in the North region of Mozambique by installing extra transformers in each of the substations:</p> <ul style="list-style-type: none"> • Chimuara (1x16 MVA, 110/33 kV transformer and 1x80 MVA, 220/110 kV transformer). • Quelimane (1 of 50/50/20 MVA, 220/33/33 kV transformer) • Alto Molocue (1 of 100/100/33 MVA, 220/110/33 kV transformer) and • Nampula (1x 50 MVA, 110/33 kV transformer). <p>OP1 was finalized in August 2020.</p> <p>Second optional Package: All main components of the project have been completed with exception of end-to-end testing of the Maputo SE – Maputo 275 SE interconnector and hot commissioning (QPR Q4 2020). Power supply to Beloluane Industrial Park consisting of installing 2x120 MVA, 275/66 kV transformers and associated equipment connected by 275kV OHL to Maputo Substation. There is still work to be completed.</p>				
Feasibility study details	Feasibility studies were prepared for EDM by Norconsult and Vattenfall for project A [12th February 2010 for (updated 13th April 2010), revised by EDM 28th April				

Summary	
	2010] and for projects B, C and C1 [8th January 2010, (updated 2nd April 2010) revised by EDM 21st April 2010]. The Feasibility studies included the preliminary Environmental Impact Assessment (EIA) including an indicative Environmental Management Plan (EMP).
Subsidy – rationale and key features	50% (OECD)
Country Context	<p>The project comprises different sub-projects with different specific objectives although the overriding objective is to fight poverty through sustainable economic development for which sufficient and reliable electricity supply is a necessity. This corresponds to the GoM Action Plan for the Reduction of Absolute Poverty, PARPA, having economic development as one of its three pillars. PARPA aims to increase per capita income and productivity, stimulate creation of employment, expand the private sector, increase national production and access to regional and international markets. Prominent among the conditions for economic development is good energy infrastructure. Thus the aims of sub-projects are:</p> <ul style="list-style-type: none"> Resolving capacity and backup problems in major substations Improving quality and capacity of power supply to Macia and also to parts of Gaza and Inhambane provinces Reinforcement of the Central Transmission Grid Reinforcement of Power Supply in Southern Region Extending the 110 kV networks to Massinga Electrifying rural areas in the Morrumbene and Homoine districts Improving power supply to the Beloluane Industrial Park in Maputo

Evaluation Questions


EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>Alignment with MFA development policies (and justification for Danida support) is discussed at Appraisal Stage i.e. Relevance for Danida's overall and cross-cutting objectives</p> <p><u>Poverty Reduction</u></p> <p>The project is in line with Danida's general policy to fight poverty in an environmentally sustainable way. Reliable power supply is considered to be important for fighting poverty through increased economic activity as also highlighted in Mozambique's PARPA. The situation of unreliable and insufficient power supply for parts of Gaza and Inhambane provinces will be remedied by this project. In the same way the project reduces risks of hampering economic activity due to failure of one of the major transformers. Finally, the LCREP (rural electrification) project for Morrumbene and Homoine district, including the connection of end-users have a direct focus on the PARPA target group.</p> <p><u>Environment</u></p> <p>Reliability of power transmission and distribution is essential for companies and private consumers for their business and social needs and is a factor in deciding whether to install backup generating sets. In the case of Mozambique where the transmission system mostly transports hydro energy from Cahora Bassa distribution and transmission reliability and sufficiency is particularly important for the environment. Smaller generating sets pollute more than larger thermal generating plant and certainly more than hydropower and are uneconomical. Even in a situation where the transmission lines would carry a mix of hydro and thermal power the negative environmental impact would be smaller than operating individual generating sets.</p> <p>As regards compliance with Danish development strategies for cooperation with Mozambique the Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011) was prepared with focal sectors Agriculture, Environment and Health (GBS M/financial support). This project was claimed to be continuation of 'old' energy sector programmes but under the Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011) 'Energy' was identified as a sector to be explicitly phased out for Danish grant support. However, this project was reportedly prepared in much the same way as main-stream Danida projects were. DSIF engagement started before the grant programme was phased out and EdM still had Danida TA in the planning and projects department. This shift was agreed with the Mozambican authorities and explicitly debated with the board of Danida and mentioned in the Danish fiscal act.</p> <p>Relevance for DSIF Financing</p> <p><u>GoM Development Policies</u></p> <p>The project was part of the GoM strategy for eradicating poverty outlined in PARPA where one of the pillars is "Sustainable economic development" for which energy supply is quoted as a necessity.</p> <p><u>Financially non-viable</u></p>	

<p>Financially, analysis shows the project and/or sub-projects have FIRR's under or close to the required discount factor. The project is then considered non-viable and not expected to be able to attract commercial financing.</p> <p><u>Economically feasible</u></p> <p>The entire project and sub-projects have a positive EIRR and the majority of the sub-projects are strongly positive. The projects then contribute positively to society's economy.</p> <p>Overall</p> <p>Overall the project complies with Danida's overall and cross-cutting objectives as regards poverty reduction and environment although grant support to the sector had been identified to be explicitly phased out of the grant-supported programme.</p> <p>JC Rating – Partly satisfactory </p>										
<p>JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account</p> <p>Alignment with Mozambique development policies was noted at Appraisal Stage: PARP 2011 – 2014 had focal sectors: Increased production & productivity – Agriculture & Fisheries, Employment promotion, Human & Social development, Good governance, M/E support with overall aims of increased economic development. GoM's intention was to increase per capita income, increase productivity, stimulate creation of employment, expand the private sector, increase the national production and its access to regional and international markets. Prominent among the conditions for economic development is good energy infrastructure.</p> <p>GoM, through EDM, controls the Mozambique power sector. GoM development policies realised the importance of the energy sector for equitable national development through economic growth and increased competitiveness of the productive sectors as detailed in the national plan for reduction of absolute poverty, PARPA II. GoM vision for the energy sector was detailed in the Energy Strategy Plan 2009-2013¹¹⁵ having focus on environmentally sustainable development. The energy strategy plan detailed the initiatives to be implemented in terms of production, transmission, distribution and rural electrification (the latter linking directly to PARPA) and the project interventions were identified in the strategy plan (some specifically, others under general needs).</p> <p>JC Rating - Satisfactory </p>										
<p>JC 1.3 Added value of Project Preparation Facility (PPF)</p> <p>Feasibility studies were prepared for EDM by Norconsult and Vattenfall for project A [12th February 2010 for (updated 13th April 2010), revised by EDM 28th April 2010] and for projects B, C and C1 [8th January 2010, (updated 2nd April 2010) revised by EDM 21st April 2010].</p> <p>As result of the positive screening of the project by Danida's Committee for Mixed Credits and upon receipt of draft feasibility studies for the two project packages an appraisal mission was fielded from 24th November to 3rd December 2009. The Final Appraisal Report (November 2010) was based on the revised version of the feasibility studies.</p> <p>The assignment for the consulting engineer (tender design, tender of the works and supervision) was tendered in the beginning of 2011 and won by the Joint Venture Norconsult/Vattenfall Power Consultant.</p> <p>JC Rating – Satisfactory </p>										
<p>JC 1.4 Complementarity with development partners operations and strategies</p> <p>Complementarity with other development partners activities in Mozambique was confirmed at Appraisal Stage: The project complements Danida (and other donors') sector programmes. Danida has a long record for financing electrical infrastructure projects in Mozambique. In Inhambane province Danida financed extension of distribution in and around Inhambane and Maxixe as well as the construction of a new power station in Inhambane. The later financing of the Chicumbane (Xai-Xai) – Lindéla 110 kV line inclusive of Lindéla Substation further enhanced supply to the Inhambane and Maxixe areas supporting the development of activities and growth in demand that is observed today. The present project's 275 (110) kV line Corumane – Liondé should eliminate reliability problems of regional supply as well as address growing need for electricity. The extension of the 100 kV networks towards Massinga provides the capacity required to expand the use of electricity that was initiated through the past Danish financed projects.</p> <p>As part of the Energy Sector Programme Support, ESPS, the supply system in Maputo has been reinforced in response to growing demand. The present project's reinforcement of Maputo Substation marks the continuation of efforts to provide reliable power supply for the capital (national economic centre) needed for the sustained economic growth that is part of GoM strategy to fight poverty.</p> <p>The project's improvement of reliability of the power supply backbone in the North is based on the same rationale and it further complements projects financed by Norway and Sweden such as the 100 kV supply to Gurue and Lichinga that depends on stable supply from Alto Molocue Substation.</p> <p>At the time of appraisal the following projects were ongoing or in pipeline:</p> <table border="1"> <thead> <tr> <th><i>Project description</i></th> <th><i>Donor institution</i></th> <th><i>Value /USD millions</i></th> <th><i>Start date</i></th> <th><i>Estimated end date</i></th> </tr> </thead> <tbody> <tr> <td>Soft loans</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	<i>Project description</i>	<i>Donor institution</i>	<i>Value /USD millions</i>	<i>Start date</i>	<i>Estimated end date</i>	Soft loans				
<i>Project description</i>	<i>Donor institution</i>	<i>Value /USD millions</i>	<i>Start date</i>	<i>Estimated end date</i>						
Soft loans										

¹¹⁵ The Plan was the subject of further refinement by WB studies i.e. Republic of Mozambique, Mozambique Energy Sector Policy Note, Energy Sector Policy Work, November 30, 2015

Energy Development and Access Programme (EDAP)	AFD	25,87	2010	2015
Rehabilitation of Mavuli and Chicamba Power Stations	AFD	64,68	2012	2016
Rehabilitation of Mavuli and Chicamba Power Stations	KfW	23,28	2013	2016
Energy Development and Access Programme (EDAP)	EIB	43,83	2011	2016
Energy Development and Access Programme (EDAP)	WB	49,20	2009	2015
Grants				
Energising Development Mozambique. Formerly: Access to Modern Energy Services in Mozambique (AMES-M) Phase 2. Started with Dutch-German partnership	ENDEV Programme	13,97	20'09	-
Rural Electrification in Sofala	EU	17,45	2008	-
Identification Mission to Mozambique in the Energy Sector	EU Africa Trust Fund	1,94	2012	-
Strategic Regional Environmental and Social Assessment for CESUL (EU Africa Trust Fund_EIB as agent)	EU Africa Trust Fund	0,91	2010	-
Support to WB trust Fund for Interconnection with Malawi and Backbone	Norway	78,81	2009	-
TA to EDM on Mega Project Development	Norway	4,67	2008	-
Rural electrification Chimbonila, Niassa	Norway	1,73	2011	
Rural electrification in Cabo Delgado	Norway	55,01	2007	2015
Rehabilitation of Mavuzi and Chicamba hydro power stations	Sweden	37,00	2013	-
Capacity building EDM + strategic studies	Sweden	6,58	2010	-
Expansion of Temane gas fired power plant	Sweden	7,77	2012	2016
Niassa rural electrification (incl Cuamba extension)	Sweden	13,00	-	2016
SMT rural electrification (incl Tete extension)	Sweden	33,00	-	2016

Source: Evaluation extract from *WB - Republic of Mozambique, Mozambique Energy Sector Policy Note, Energy Sector Policy Work, November 30, 2015*

JC Rating – Satisfactory 

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

The Project was recommended for DSIF financing satisfying the following criteria in that the project was found to be:

- highly beneficial to the development of Mozambique
- contributing positively to GoM's efforts to reduce poverty in the project areas through increased production, competitiveness and income
- technically sustainable
- financially non-viable
- economically feasible
- organisationally sustainable
- environmentally sustainable (subject to impacts being handled in a professional and acceptable manner)

Overall it was found that this project was appropriate for DSIF financing.


Although the relevance of the project to Danida and national policies has been discussed there is very limited consideration of development outcomes as such. At Appraisal Stage consideration was confined to the following: Outcome is more complex to monitor, as it can be difficult to separate the project's outcome from the outcome of other activities. One example is growth in earnings in the project area. Part of the growth will be due to the reliable power supply but other activities could also generate increased earnings and it will be difficult or impossible to establish the part of the growth owed to the project. In order to avoid doubtful indicators the Team recommends, instead of monitoring general socio-economic parameters, to focus on outcome that has close link with the project. Monitoring of outcome shall be undertaken by EDM yearly during the five years following commissioning and shall be reported to the Secretariat for Mixed Credits.

Outcomes

- Line unavailability in percent of time of maximum 0,1% to be calculated at the end of the first year of operation for Macia and at Massinga
- Unserved energy of 0,75% maximum, to be calculates at the end of first year of operation, for Macia and Massinga

- Growth in energy transmitted to the project area in line with GDP growth
- Development in peak load compared to the load growth forecasts for the different areas in the Gaza and Inhambane provinces as well as for the Beloluane Industrial Park

Specified outcome indicators relate only to performance and utilisation of the infrastructure delivered by the project. No indicators refer directly to the two rural electrification interventions in Gaza and Inhambane Provinces. Given that the project is only now coming to a close, the expected outcomes are only now starting to be realised

JC Rating –Satisfactory 

EQ 1 Overall Rating –Satisfactory

The project is highly relevant there is alignment with high level MFA development policies, strategy and cross-cutting objectives as regards poverty reduction and environment. Reliability of power transmission and distribution is essential for companies and private consumers for their business and social needs and is a factor in deciding whether to install backup generating sets. In the case of Mozambique where the transmission system mostly transports hydro energy from Cahora Bassa distribution and transmission reliability and sufficiency is particularly important for the environment. As regards compliance with Danish development strategies for cooperation with Mozambique this project was claimed to be continuation of 'old' energy sector programmes but under the Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011) 'Energy' was identified as a sector to be explicitly phased out for Danish grant support whilst the strategy was prepared with focal sectors Agriculture, Environment and Health (GBS M/financial support). Alignment with Mozambique development policies in terms of overall aims of increased economic development, to increase per capita income, increase productivity, stimulate creation of employment, expand the private sector, increase the national production and its access to regional and international markets. GoM development policies realised the importance of the energy sector for equitable national development through economic growth and increased competitiveness of the productive sectors as detailed in the national plan for reduction of absolute poverty, PARPA II. The energy strategy plan detailed the initiatives to be implemented in terms of production, transmission, distribution and rural electrification

Feasibility studies were prepared for EDM by Norconsult and Vattenfall.

Complementarity with other development partners' activities in Mozambique was confirmed. The project complements Danida (and other donors') sector programmes - Danida has a long record for financing electrical infrastructure projects in Mozambique.

The Project was recommended for DSIF financing satisfying its selection criteria Overall it was found that this project was appropriate for DSIF financing.

Although the relevance of the project to Danida and national policies has been discussed there is very limited consideration of development outcomes as such. Specified outcome indicators relate only to performance and utilisation of the infrastructure delivered by the project. No indicators refer directly to the two rural electrification interventions in Gaza and Inhambane Provinces.

Given that the project is only now coming to a close, the expected outcomes are only now starting to be realised





EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
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JC 2.1 Systematic research for coherence with MFA development policies and strategy

Alignment with MFA development policies (and justification for Danida support) was confirmed at Appraisal Stage in terms of relevance for Danida's overall and cross-cutting objectives i.e.

- Poverty Reduction - the project is in line with Danida's general policy to fight poverty in an environmentally sustainable way.
- Environment - reliability of power transmission and distribution is essential for companies and private consumers for their business and social needs and is a factor in deciding whether to install backup generating sets. Smaller generating sets pollute more than larger thermal generating plant and certainly more than hydropower and are uneconomical.
- Gender - reinforcement of basic infrastructure benefits society and does not have a particular gender dimension; however, the present project package contains a rural electrification component in Inhambane Province (under the LCREP rural electrification initiative) which is generally beneficial for women.
- Anti-corruption – DSIF upholds zero-tolerance towards corrupt practices and requires the same from the Employer, contractors and consultants financed by DSIF.
- HIV/AIDS - where transmission line construction extends over 300 km the construction contract included obligations to carry out awareness campaigns not only for the contractor's personnel but also for inhabitants in the villages in the vicinity of the transmission line corridor, to be repeated as line construction advances.

In terms of specific relevance for DSIF Financing the project is compliant with GoM development policies (i.e. strategy for eradicating poverty outlined in PARPA where one of the pillars is "Sustainable economic development" for which energy supply is quoted as a necessity). The project was also found to be financially non-viable and not expected to be able to attract commercial financing (the project and/or sub-projects have FIRR's under or close to the required discount factor) and economically feasible (project and sub-projects have a positive EIRR and the majority of the sub-projects are strongly positive)

Overall the project complies with MFA's overall and cross-cutting objectives as regards poverty reduction and environment (although grant support to the sector had been identified to be explicitly phased out).	
JC Rating – Satisfactory 	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
As regards compliance with Danish development strategies for cooperation with Mozambique the Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011) was prepared with focal sectors Agriculture, Environment and Health (GBS M/financial support). This project was claimed to be continuation of 'old' energy sector programmes but under the Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011) 'Energy' was identified as a sector to be explicitly phased out for Danish grant support. However, this project was reportedly prepared in much the same way as main-stream Danida projects were. DSIF engagement started before the grant programme was phased out and EdM still had Danida TA in the planning and projects department. This shift was agreed with the Mozambican authorities and explicitly debated with the board of Danida and mentioned in the Danish fiscal act.	
JC Rating - Satisfactory 	
JC 2.3 Danish business links with beneficiary countries	
Danish business links were considered and it was concluded that Danish contractors and, to some extent, engineers had proven experience in this kind of project and had indicated positive interest in bidding for the project. It was noted that Danish contractors have a long/standing record of constructing overhead transmission lines and substations in Mozambique, under Danish financing, in projects similar to this one. It was expected that tendering in Denmark would be successful and show a satisfactory level of competition among contractors. For engineering services expertise also exists. However, considering the qualifications and experience required for substation and line construction as well as the expected limited competition, it was recommended that also non-Danish engineering companies to be allowed on the short list in order to enhance competition. In the event the contractor was JV Per Aarsleff/Seth. The client of the project was Electricidade de Moçambique (EDM). Aarsleff carried out the contract in joint venture with the Portuguese contracting company Seth S.A. The high-tension transmission lines were subcontracted to Eltel Networks TE AB, and ABB AB supplied the equipment for the transformer stations. The consultant JV Norconsult/Vattenfall Power was appointed to undertake design, tendering and supervision (contract signed 2011).	
JC Rating – Satisfactory 	
EQ 2 Overall Rating – Satisfactory 	
With this project DSIF has been able to create coherency with general MFA development policies and strategy. Alignment with MFA development policies (and justification for DSIF support) was confirmed in terms of relevance for DSIF's overall and cross-cutting objectives i.e. poverty reduction, environment, gender, anti-corruption and HIV/AIDS. In terms of specific relevance for DSIF Financing the project is compliant with GoM development policies, the project was also found to be financially non-viable and not expected to be able to attract commercial financing and economically feasible. Overall the project complies with MFA's overall and cross-cutting objectives as regards poverty reduction and environment (although grant support to the sector had been identified to be explicitly phased out).	
As regards synergies/complementarity with other Danish development initiatives the project was not compliant with focal sectors Agriculture, Environment and Health specified under Danish development strategies for cooperation with Mozambique the Draft Strategy Concept Note (2006) for Danish Development Cooperation with Mozambique for next country strategy cycle (2007 – 2011). This project was claimed to be continuation of 'old' energy sector programmes but under the Draft Strategy 'Energy' was identified as a sector to be explicitly phased out for Danish grant support. However, this project was reportedly prepared in much the same way as main-stream Danida projects were. DSIF engagement started before the grant programme was phased out and EdM still had Danida TA in the planning and projects department. This shift was agreed with the Mozambican authorities and explicitly debated with the board of Danida and mentioned in the Danish fiscal act.	
Danish business links were considered and it was concluded that Danish contractors had proven experience in this kind of project and had indicated positive interest in bidding for the project. Danish contractors have a long/standing record of constructing overhead transmission lines and substations in Mozambique. However, considering the qualifications and experience required for substation and line construction as well as the expected limited competition, it was recommended that also non-Danish engineering companies to be allowed on the short list in order to enhance competition. In the event the contractor was JV Per Aarsleff/Seth. Per Aarsleff carried out the contract in joint venture with the Portuguese contracting company Seth S.A whilst a considerable proportion of the total contract value was sub-contracted - the HT transmission lines were subcontracted to Eltel Networks TE AB, and ABB AB supplied the equipment for the transformer stations.	
EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	

<p>DSIF provided funding for (i) transmission lines with the associated sub-stations and (ii) other smaller projects increasing access to electricity in rural parts of Mozambique. Given that Mozambique was and remains a low income country a subsidy package of 50% was arranged. DSIF's financial additionality was principally in the form of concessional funding and grants, which were necessary given the negative financial rate of return that was demonstrated by the financial analysis at appraisal. The primary reason for the lack of financial viability is the tariffs that are too low to cover FWASA's operating costs. Since the project is not financially viable commercial finance was not possible.</p> <p>JC Rating – Satisfactory </p>
<p>JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework') additionality</p> <p>Project design was undertaken by consultant JV Norconsult/Vattenfall Power. The field visit in April 2021 found that the main forms of DSIF non-financial additionality as perceived by EDM were:</p> <ul style="list-style-type: none"> • DSIF very good to work with – professionalism, serious, always available • Well-co-ordinated cooperation between EDM and DSIF (joint decision making) • Construction contract arrangements (consultant, contractor, supervisor) worked well • Prompt procedures and decision making by DSIF (appraisal, EIA, consultation processes) – transparent process over about 3 months including financing, tendering, commissioning <p>Training was intended to be carried out for operation of installed equipment and according to the 'TOR for Technical Assistance to Monitoring the Implementation and Verifications of the project', such training was to be reported upon in progress reporting as an output indicator (including an assessment of the effectiveness of the included training components) although there appears to have been little such reporting (e.g. QPRs Oct-Dec 2020).</p> <p>Training is included under contract Schedule 3, Services, SRV-080 to 084 related to control and protection systems, MV and HV switchgear, power transformers and all relevant substation equipment. Training courses SRV-080 through 083 that have been invoiced 100% (although documentation regarding the accomplishment of this training has yet to be produced). Training course SRV-084 (not invoiced as of IPC no. 32) was programmed to be held in Zimbene (19-23 Feb 2021) and Lindéla (26 Feb – 02 March 2021). According to EDM all trainings courses provided and all documentations submitted¹¹⁶.</p> <p>During the field visit it was suggested that the capacity building aspect for EDM staff could have been dealt with in a different perspective. EDM technicians have the capacity to do their job but they are not certified and because they are not certified, they cannot work at the MOTRACO substation.</p> <p>JC Rating – Satisfactory </p>
<p>JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding</p> <p>No commercial financing was involved.</p> <p>JC Rating – N/A</p>
<p>EQ 5 Overall Rating – Satisfactory </p> <p>The proposed project under package A was found to be financially non-viable (noting that updated feasibility studies were necessary before a similar financial analysis could be concluded for components B & C). Project design was undertaken by consultant JV Norconsult/Vattenfall Power and thus provided non-financial additionality. Only DSIF financing; no commercial funding was involved. Training (for control and protection systems, MV and HV switchgear, power transformers and all relevant substation equipment) was provided under the main contract.</p>


EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1	Satisfactory implementation of infrastructure projects
<p>Project infrastructure is largely completed (although some defects have yet to be remedied as revealed by Particip field visits) - following Verification Reports¹¹⁷ have been scrutinised by the evaluation:</p> <ul style="list-style-type: none"> • Implementation Monitoring Partial Verification Report at Expiry of Defects Notification Period for Main Package Section A (Section A concerns the extension to Ressano Garcia Substation, the new substation at Zimbene, the 275 kV overhead line connecting these substations as well as related telecommunication) Report dated 20th July 2019 • Implementation Monitoring Draft Verification Report at Taking Over of Section A (Section A concerns the extension to Ressano Garcia Substation, the new substation at Zimbene, the 275 kV overhead line connecting these substations as well as related telecommunication) Final report dated 26th February 2018 • Implementation Monitoring Partial Verification Report at Expiry of Defects Notification Period for Main Package Section B (Section B concerns the extension to Lindéla Substation, the new substation at Massinga, the 110/33 	

¹¹⁶ Source: Implementation Monitoring: Partial Verification Report at Expiry of Defects Notification Period for Main Package Section A. Report dated 20th July 2019 Preben Jørgensen Verification Party

¹¹⁷ All reports by Preben Jørgensen Verification Party

kV overhead line connecting these substations and Maxixe Substation as well as related telecommunication) Report dated 20th July 2019

- Implementation Monitoring Verification Report at Taking Over of Section B (Section B concerns the extension to Lindéla Substation, the new substation at Massinga, the 110/33 kV overhead line connecting these substations and Maxixe Substation as well as related telecommunication) Final report dated 1st November 2018
- Implementation Monitoring Draft Verification Report a Taking Over of Section C (Section C concerns project parts not included in sections A and B including rural electrification) Report dated 14th November 2016

JC Rating –Satisfactory 

JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)

Specified outcome indicators (listed below) relate only to performance and utilisation of the infrastructure delivered by the project. No indicators refer directly to the two rural electrification interventions in Gaza and Inhambane Provinces

- Line unavailability in percent of time of maximum 0,1% to be calculated at the end of the first year of operation for Macia and at Massinga
- Unserved energy of 0,75% maximum, to be calculates at the end of first year of operation, for Macia and Massinga
- Growth in energy transmitted to the project area in line with GDP growth
- Development in peak load compared to the load growth forecasts for the different areas in the Gaza and Inhambane provinces as well as for the Beloluane Industrial Park

It is suggested that the following IFC Power Indicators¹¹⁸ could better identify and document outcomes:

IFC power indicators:

a. Project Outcomes

- Increases access to reliable, affordable power:
 - Access - Energy delivered to off-taker(s) during the reporting period, GWh • New users reached, # ... of which share of new users from underserved groups (rural, low income, etc.), %
 - Quality - Number of power outages, #/month or SAIFI • Average length of power outages, hours or SAIDI • Average transmission & distribution losses, % of output
 - Affordability • Average end-user tariff, USc/kWh • Average cost of generation, USc/kWh
- Leads to direct, indirect, and induced effects on GDP and employment:
- Results in potentially significant environmental and social effects,

b. Contributions to Market Creation

- Improves market structure and functioning
- Improves sector resilience and quality of supply
- Increases the spatial connectivity of the electricity systems
- Leads to adoption of new sustainability, climate mitigation, and/or adaptation
- Introduces inclusive business models

However, given that the project is only now coming to a close, outcomes are only now starting to be realised. The following observations were made during the field visit as regards the two rural electrification components:

Rural electrification in Homoine (7 de Setembro and 3 de Fevereiro Neighbourhoods) and Chibuto (Muxaxane Locality and Uhamuza Neighbourhood) districts

A total of 46km power line, connecting about 5.000 clients.

Homoine district


- A total of 13 transformers (2 with 160kV and 11 of 100 kV) were installed, one at the headquarters in Inhambane and the other 12 in Homoine district HQ benefiting two neighbourhoods (7 de Setembro and 3 de Fevereiro).
- The rural electrification took place during the period when the government was implementing the project named "LIGA LUZ" which promoted the household electricity connection. Hence the price to connect electricity to the household was low, at 875 MZN.
- In Homoine split meters are being installed, and it is believed that they are safe as the smart meter is installed at the electricity take-off post. According to EDM, there have been no cases of theft, electricity by-pass or users stealing electricity as it is not easy to do so with split meters.
- Interviews were carried out with two categories of users: those using electricity for household consumption and those using for small business. It was revealed that:
 - The quality of the service is good and there are no frequent power cuts
 - The tariffs differ depending on the category of the user. The tariffs for household users are about 8 MZN / kW and about 14 MZN for small business users. In general, the price for both categories is affordable.
 - For small business users the first electricity purchase in a month has three categories: a) purchase of 0-100 kW which is cheap, b) 100 – 200 kW which is relatively more expensive and c) above 200 kW which is the most expensive.
 - The users can purchase electricity remotely (using their mobile phones) or from the shop or EDM outlet.

¹¹⁸ IFC Anticipated Integrated Measuring and Monitoring (AIMM) Power Sector Framework – March 2019
<https://www.ifc.org/wps/wcm/connect/9f89e8f3-62fd-4af0-9c23-3c59f74a2630/AIMM-Power-Consultation.pdf?MOD=AJPERES&CVID=nmTfdlr>

Chibuto district

In Chibuto, two localities (Muxaxane and Uahamuza) benefited from rural electrification.

- In Muxaxane five neighbourhoods have been connected to the grid by the project since June 2016.
- The beneficiaries use “integrated meters” although EDM is gradually replacing the integrated meters with split meters – so whenever a client has a problem with the integrated meter, the old meter is replaced by a split meter.
- Some users connected electricity before the ‘LIGA LUZ’ project and paid 3,500 MZN per household connection. Later the ‘LIGA LUZ’ project was implemented, and users who connected electricity under the ‘LIGA LUZ’ project paid 875 MZN. Currently, it is free to connect electricity in Mozambique as the government is promoting electricity connection countrywide.
- In Nguetsemene area, the electricity cable is low because one post was knocked down by a vehicle two years ago and it has not been fixed yet.
- There are some problems in Muxaxane. During the field visit many users were complaining about different kinds of problems. The most common problem was that after the electricity units are consumed, when the user buys units they cannot be recharged. The EDM technician from Xai-Xai (Gaza province HQ) who accompanied the field visit tried to fix some problems reported during the visit, and it was not possible. The users were promised that a team would be sent to help them solve their problems. However, given that users have reportedly been facing those problems for a long time, there is a suspicion that EDM technical assistance may be weak in Muxaxane.

JC Rating –Satisfactory 

JC 6.3 Environmental, social and governance (ESG) risk management

Although an EIA and ESMP were prepared at Feasibility Stage, at Appraisal Stage it was clear that further detailed work would be necessary at pre-tender stage as locations and line of a number of proposed facilities had still to be fixed.

Environmental Impacts

Preliminary Environmental Impact Assessment, EIA, inclusive of indicative Environmental Plans, EMP, included in the feasibility studies for the proposed projects were considered at appraisal stage. Given the reformulation of the projects it was assumed that the findings concerning the original overhead transmission line between Infulene and Macia included in Norconsult study was also valid for the amended transmission lines, Corumane – Lionde, Lindéla – Massinga and Massinga – Maxixe. The studies related to the transformer stations contained in Vattenfall’s study was still valid since the project component related to substations were unchanged (this assumption was similarly considered valid for the new Massinga substation that was not part of the original project. However, since the precise location of this substation was unknown, impacts related to the acquisition of land could only be dealt with in detail during the pre-tender design phase as regards impacts due to the construction of the overhead lines feeding into this substation.

Impacts considered in the ESIA and ESMP cover impacts during construction, operation and demolition of the installations at the end of the installations’ technical life.

Mitigation of impacts was handled in conformity with the Mozambican legislation (MICOA) in line with the World Bank’s guidelines.

The project components related to substations took place inside stations belonging to EDM and MOTRACO or on land belonging to these companies adjacent to the existing substations. These project components had no major environmental impacts. Impacts resulting from the new 110/33 kV substation at Massinga could only be assessed after the location had been fixed (although impacts were mitigated as per above)




The major impacts of the project related to obtaining Right of Way (ROW) for the new transmission lines i.e. Corumane – Lionde and Lindéla – Massinga. For a 275 kV line a corridor of approx. 50 meters is required while for a 110 kV line 30 – 35 meters is considered sufficient. According to Mozambican legislation, obtaining ROW for these line corridors requires compensation of owners of buildings and structures as well as crops in the corridor. In case of resettlement of people living in the corridor national legislation in line with WB’s guidelines applies. As part of the implementation process a detailed study was carried out in order to establish the final line routing and the precise extent of resettlement and compensation including costs of compensation and careful identification of all affected persons. The resettlement action plan and its execution were financed and undertaken by EDM and were a source of continuing delay and disruption of the implementation programme.

Resettlement is particularly important and was discussed in detail with MICOA. The basic principle is that persons to be resettled would be offered accommodation at least of same size and standard as the one to be abandoned. For this category compensation in the form of cash would not be offered. For other buildings and structures to be demolished as well as for trees and crops cash compensation would be offered.

Resettlement was expected to be minimal given the alternative solutions for line routing (Corumane – Lionde instead of Infulene, Manhiça – Xinavane – Macia) and which became part of the revised feasibility study.

It was found that there was limited need for resettlement along these corridors as was also the case for the 110 kV line Lindéla – Massinga and 33 kV Massinga – Maxixe line although compensation for crops was found to be quite substantial.

It was the responsibility of EDM to finance compensation as well as other costs related to obtaining the ROW, such as demining. A mechanism was established to try to ensure that the Contractor’s mobilisation was only launched when it had been confirmed that funding for ROW compensation was available. The mechanism which aimed at eliminating the risk of contractual claims for delays was only partially successful.

<p>Another aspect of mitigation could be that the people impacted by the line construction benefit from the line. Generally, when constructing transmission lines those bypassed do not benefit or only benefit indirectly from the line and very often those that support the impacts do not access to electricity supplies (as the transmission line is usually high voltage which cannot be directly used for local distribution).</p> <p>In this project it was suggested that those persons living near the line corridors for Lindéla – Massinga and Maxixe – Massinga should already have the possibility of supply since MV-lines and a substantial number of small distribution transformers had been included in previous Danish-financed projects in the area.</p> <p><u>Cost Estimates</u></p> <p>ESMP estimated costs were originally estimated as low and more detailed costing was undertaken when the Environmental Action Plan was prepared which detailed all activities, time schedules and budget (the bulk of which concerned compensation costs).</p> <p>JC Rating - Satisfactory </p>
<p>JC 6.4 Contribution to climate change mitigation, green and inclusive development</p>
<p>No reference to climate change mitigation, green and inclusive development (but reduction of emissions is covered in the economic analysis). Given that most power in Mozambique is hydro-generated, GHG emissions from generation are minimal. Improved reliability of supply also negates the need for standby generators which have significant GHG emissions.</p> <p>JC Rating – Satisfactory </p>
<p>JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth</p>
<p>As the Helsinki Principles for carbon and climate resilient growth were issued in 2019 this is not applicable.</p> <p>JC Rating – N/A</p>
<p>EQ 6 Overall Rating – Satisfactory </p> <p>The project has as yet not delivered all expected outcomes (as the infrastructure has only recently been completed and some defects have yet to be resolved) although there is no reason to believe that expected development outcomes will not be achieved (the field visits support this conclusion) albeit that whilst development benefits were discussed in project documentation the specified outcome indicators refer only to technical performance of the project outputs. ESG risk management has been effective although the original ESIA and ESMP were produced at a stage when considerable details still had to be worked out – this was a design and build contract – such that original estimates were found to be low and some important details were only established during implementation (such as the location of some transmission lines). Compensation and resettlement needs were recognised (if not initially quantified) but, as is often the case, delays arose due to negotiations during implementation and problems with payment of compensation (EDM/GOM responsibility) and thus some works programmes were disrupted leading to delays/standing time and the contractor raising claims for additional costs, loss of production etc. There is little or no reference to climate change mitigation, green and inclusive development (but reduction of emissions is covered in the economic analysis) - given that most power in Mozambique is hydro-generated, GHG emissions from generation are minimal whilst improved reliability of supply also negates the need for standby generators which have significant GHG emissions. No other reference is made to greenhouse gas emission avoidance (except in the economic analysis) or Helsinki Principles in documentation examined by the evaluation (although not expected to be significant) and no ex-ante/ex-post comparisons have been scrutinised by the evaluation. No unintended impacts have been identified.</p>

<p>EQ 7 Commercial /developmental balance</p>	<p>Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?</p>
<p>JC 7.1 Satisfactory development outcomes(using DAC definition of impact)</p>	<p>Development outcomes have been mentioned to a limited extent in project documentation and the specified outcome indicators refer largely to technical performance of project outputs/deliverables. Although there has been consistent progress reporting (see below also) such monitoring has concentrated on project implementation activities and outputs. However, given that the project is coming to a close, outcomes are starting to be realised. Apart from an expected contribution to national economic development by way of more reliable power supplies there are also potential development outcomes which result from not only the project as a whole but also the rural electrification components in Homoine and Chibuto districts of Inhambane and Gaza Provinces (some neighbourhood connections going back to 2016). The following observations were made during the field visit as regards the two rural electrification components which potentially connect about 5000 clients to the supply network:</p> <ul style="list-style-type: none"> • The rural electrification took place during the period when the government was implementing the project named “LIGA LUZ” which promoted the household electricity connection and was thus fully complementary to this national programme. Currently, it is free to connect electricity in Mozambique as the government is promoting electricity connection countrywide • To ensure measurement of consumption (and payment) split meters are being installed - there have been no reported cases of theft, electricity by-pass or users stealing electricity.

- In interviews were carried out with householders and small businesses it was reported that: the quality of the service is good¹¹⁹ and there are no frequent power cuts, tariffs for household users and small business users are reported to be affordable.
- Users can purchase electricity remotely (using their mobile phones) or from the shop or EDM outlet.


JC Rating – Partly Satisfactory 

JC 7.2 Strong ESG performance of DSIF projects

No negative ESG issues have been encountered in project reporting documentation or during the field visits. An EIA and ESMP were prepared at Feasibility Stage and Appraisal Stage although it was clear that further detailed work would be necessary post-tender when detailed design was finalised as locations and line of a number of proposed facilities had still to be fixed. ESMP estimated costs were originally estimated as low and more detailed costing was undertaken when the ESMP was prepared which detailed all activities, time schedules and budget (the bulk of which concerned compensation costs). Impacts considered in the ESIA and ESMP cover impacts during construction, operation and demolition of the installations at the end of the installations' technical life. Mitigation of impacts was handled in conformity with the Mozambican legislation (MICOA) in line with the World Bank's guidelines. The major impacts of the project related to obtaining Right of Way (ROW) for the new transmission lines - for a 275 kV line a corridor of approx. 50 meters is required while for a 110 kV line 30 – 35 meters is considered sufficient.

Resettlement is particularly important and was discussed in detail with MICOA. According to Mozambican legislation, obtaining ROW for these line corridors requires compensation of owners of buildings and structures as well as crops in the corridor. In case of resettlement of people living in the corridor national legislation in line with WB's guidelines applies. Resettlement was expected to be minimal given the alternative solutions for line routing and which became part of the revised feasibility study. It was the responsibility of EDM to finance compensation as well as other costs related to obtaining the ROW, such as demining.

Another aspect of mitigation could be that the people impacted by the line construction benefit from the line. Generally, when constructing transmission lines those bypassed do not benefit or only benefit indirectly from the line and very often those that support the impacts do not access to electricity supplies (as the transmission line is usually high voltage which cannot be directly used for local distribution). In this project it was suggested that those persons living near the line corridors for Lindéla – Massinga and Maxixe – Massinga should already have the possibility of supply since MV-lines and a substantial number of small distribution transformers had been included in previous Danish-financed projects in the area.

JC Rating – Satisfactory 

JC 7.3 Satisfactory financial returns and portfolio performance


At the time of project preparation (2008) EDM's latest annual report announced a modest profit illustrated that the level of tariffs allowed approximate break-even and that EDM capacity to support new investments was unsustainable without GOM stepping in¹²⁰. Thus, if GoM were to pursue its policies of increased the electrification rate it would require either to increase tariffs (as suggested by World Bank) or to bring in equity, which was reportedly taking place to some extent. Given that the utility was operating on very small profit margins the financial incentive to make this project investment was limited and the profit loss for unserved energy is low. At that stage it was expected that EDM would obtain support from government in the form of tariff increase or subsidies. By 2015 the situation had not changed much¹²¹. Tariffs decreased by about 20% in real terms between 2010 and 2014. A 26,4% nominal tariff increase in October 2015 meant that, in real terms, 2015 tariffs were just about three percentage points higher than in 2010. For residential customers, tariffs were still five percentage points lower than in 2010. In other wards EDM's financial condition did not actually improve to the point of financial viability (EDM was forecast to make a net loss until 2018) when significant exports were expected from 2019 onwards. EDM was forecast to generate net profit from 2019. Before that, even though EDM's cash flow is positive, it is not sufficient to fund the rising debt costs, resulting in a net loss until 2018. Meanwhile, EDM needed to be able to operate and maintain the existing system. To do so, its current tariffs would need to cover the cost of operations and maintenance (O&M) and it was estimated that a tariff increase of 35% would have been required in 2015, followed by inflation level increases to cover O&M only. Such increases would have enabled a positive net profit. Overall there is a continuing story of lack of EDM financial viability in part arising from GOM policy to keep down electricity tariffs to an affordable level. That being said, it is reported that policy dialogue in relation to potential poverty alleviation effects of the investment was an integral part of the policy dialogue during project preparation, including in well-established sector working groups on environment and electricity supply together with government and other donors. This dialogue dealt with risks associated to tariff policies, regional cross-subsidies, company structure – including transfer pricing – and it impacted on both project design and company policies. It assured that the investment actually benefits poor people and that subsidy in project finance is transferred to poor consumers through tariffs and project design and not wasted or creamed off to other entities

¹¹⁹ Although some problems have been reported (in Muxaxane) including recharge of the meter (after the electricity units are consumed) can be a problem. Given that users have reportedly been facing those problems for a long time, there is a suspicion that EDM technical assistance may be weak.

¹²⁰ This was also the conclusion of World Bank in the Appraisal of the APL-2 Project January 2009

¹²¹ Source: Report No: ACS17091 Republic of Mozambique Energy Sector Policy Note Energy Sector Policy Work . November 30, 2015

JC Rating – Partly satisfactory 

EQ 7 Overall Rating – Partly Satisfactory 


Satisfactory development outcomes (using DAC definition of impact) may be expected although development outcomes have been mentioned to a limited extent in project documentation and the specified outcome indicators refer largely to technical performance of project outputs/deliverables. Apart from an expected contribution to national economic development by way of more reliable power supplies there are also potential development outcomes which result from not only the project as a whole but also the rural electrification components in Homoine and Chibuto districts of Inhambane and Gaza.

No negative ESG issues have been encountered in project reporting documentation or during the field visits. ESMP estimated costs were originally estimated as low and more detailed costing was undertaken when the ESMP was prepared which detailed all activities, time schedules and budget. Impacts considered in the ESIA and ESMP cover impacts during construction, operation and demolition of the installations at the end of the installations' technical life. Mitigation of impacts was handled in conformity with the Mozambican legislation (MICOA) in line with the World Bank's guidelines. Resettlement is particularly important and was discussed in detail with MICOA.

There were continuing unsatisfactory financial returns.. Tariffs decreased by about 20% in real terms between 2010 and 2014. For residential customers, tariffs were still five percentage points lower than in 2010. In other wards EDM's financial condition did not actually improve to the point of financial viability although EDM was forecast to generate net profit from 2019. Before that, even though EDM's cash flow is positive, it is not sufficient to fund the rising debt costs, resulting in a net loss until 2018. Meanwhile, EDM needed to be able to operate and maintain the existing system. To do so, its current tariffs would need to cover the cost of operations and maintenance (O&M) and it was estimated that a tariff increase of 35% would have been required in 2015, followed by inflation level increases to cover O&M only. Overall there was a continuing story of lack of EDM financial viability in part arising from GOM policy to keep down electricity tariffs to an affordable level. That being said, it is reported that policy dialogue in relation to potential poverty alleviation effects of the investment was an integral part of the policy dialogue during project preparation, including in well-established sector working groups on environment and electricity supply together with government and other donors. This dialogue dealt with risks associated to tariff policies, regional cross-subsidies, company structure – including transfer pricing – and it impacted on both project design and company policies. It assured that the investment actually benefits poor people and that subsidy in project finance is transferred to poor consumers through tariffs and project design and not wasted or creamed off to other entities

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?		
JC 8.1 Level of economic viability			
At Appraisal an independent economic analysis was carried out (which updated the previous analysis undertaken at feasibility stage) - the results are shown in the below table. All amounts in USD			
Sub-project	Investment (*) **) (***)	EIRR	Ranking acc. EIRR
Beloluane supply	24.183.600	4,1%	5
Reinforcement of supply Gaza and Inhambane	48.783.000	34,0%	1
400 MVA transformer Maputo SE	24.694.950	21,6%	2
Extra Transformers in Chimuara, Quelimane, Nampula, Alto Molocue	14.282.100	20,8%	3
RE for Morrumbene and Homoine	10.139.220	15,8%	4
Total Package	122.082.870	22,4%	
*) Not including preliminaries and contingencies			
**) Not including costs for Right of Way			
***) Including engineering and management costs			
Considering the projects' poverty alleviation dimension it was recommended following this ranking as an indication of the project's priority, however, including the rural electrification project in the reinforcement of supply in Gaza and Inhambane provinces. The proposed Implementation Plan was based on a sequencing that reflected the above ranking of projects, i.e. the projects to be implemented in the following order: Reinforcement of supply in Gaza and Inhambane provinces Extension of Maputo SE by one (01) extra 400 MVA, 400/275 kV transformer Extension of Chimuara, Quelimane, Alto Molocue and Nampula SE by extra transformers Extension of Maputo SE by two (02) 120 MVA, 275/66 kV transformers destined at supplying the Beloluane Industrial Park			
The project consists mainly in reinforcing and expanding the backbone of the Mozambican power system, which is indispensable for the continued and equal economic growth of the country. Reliability of power transmission and			

distribution is essential for companies and private consumers for their business and social needs. In Mozambique where the transmission system mostly transports hydro energy from Cahora Bassa distribution and transmission reliability and sufficiency is particularly important.

JC Rating - Satisfactory 

JC 8.2 Level of commercial/financial viability of infrastructure

Financial Viability

Danida's Mixed Credit financing requires that projects are financially non-viable.

Based on the feasibility studies presented it was found that the projects proposed in the Main Package were financially non-viable. Projects in the optional packages (OP1 and OP2) were assessed based on updated feasibility studies.

Financial Viability "after DSIF"

DSIF support included a grant element covering interest etc. amounting to 50% of the total cost of the project value. The project was assessed for financial viability "after DSIF support" (i.e. the financial viability of the projects was re-assessed when the grant and subsidy elements were taken into account) thus improving FIRR across all components.

Feasibility studies included sensitivity analysis showing that the projects were fairly insensitive to increases in investment costs and to variations in the volume of sales. On the contrary an increase in the costs for energy had an important impact on the FIRR. Doubling costs from 2 US cents to 4,5 US cents reduced FIRR by 4 points. As a quality control and in order to precisely link project investments to the corresponding benefits and to exclude benefits from carbon credits an independent financial analysis was carried out. This analysis of the project package in the following section was based on elements from EDM's feasibility study.

Financial Analysis

A separate financial analysis was carried out separate for each project theme and for the entire project package: All amounts in USD

Sub-project	Investment) **) ***)	EIRR	FIRR "general terms"	FIRR "Mixed credits terms"	Financial NPV @ 6% disc	Negative part cash flow
Beloluane supply	24.183.600	4,1%	3,1%	8,5%	2.629.501	-10.525.599
Reinforcement of supply Gaza and Inhambane	48.783.000	34,0%	2,6%	7,6%	3.189.807	-22.042.034
400 MVA transformer Maputo SE	24.694.950	21,6%	-1,7%	-0,5%	-6.491.239	-16.270.325
Extra Transformers in Chimuará, Quelimane, Nampula, Alto Molocue	14.282.100	20,8%	-1,3%	0,2%	-3.378.352	-9.205.518
RE for Morrumbene and Homoine	10.139.220	15,8%	-1,1%	0,5%	-2.320.227	-6.499.988
Total Package	122.082.870	22,4%	1,2%	4,8%	-6.370.563	-64.543.464

*) Not including preliminaries and contingencies

**) Not including costs for Right of Way

***) Including engineering and management costs

Overall, it can be concluded that the total project was non-financially viable (i.e. not expected to be able to attract commercial financing) while it was economically viable but it would be necessary for EDM to support a total negative cash flow. Whereas some sub-projects have negative cash flow the first 10 years, the global negative cash flow only extends over the first few years of operation (although this supposes that all sub-projects are put into operation at the same time).

However, at the time of project preparation the level of tariffs allowed approximate break-even but EDM capacity to support new investments was unsustainable without GOM support. By 2015 the situation had not changed much. Tariffs decreased by about 20% in real terms between 2010 and 2014 and after a nominal tariff increase in 2015 in real terms, 2015 tariffs were just about three percentage points higher than in 2010. EDM's financial condition had not improved to the point of financial viability (although EDM was forecast to generate net profit from 2019). Meanwhile, EDM needed to be able to operate and maintain the existing system. To do so, its current tariffs would need to cover the cost of operations and maintenance (O&M) and it was estimated that a tariff increase of 35% would have been required in 2015, followed by inflation level increases to cover O&M only. Overall there is a continuing story of lack of EDM financial viability in part arising from GOM policy to keep down electricity tariffs to an affordable level. That being said, it is reported that policy dialogue in relation to potential poverty alleviation effects of the investment was an integral part of the policy dialogue during project preparation, including in well-established sector working groups on environment and electricity supply together with government and other donors. This dialogue dealt with risks associated to tariff policies, regional cross-subsidies, company structure –

including transfer pricing – and it impacted on both project design and company policies. It assured that the investment actually benefits poor people and that subsidy in project finance is transferred to poor consumers through tariffs and project design and not wasted or creamed off to other entities

JC Rating – Partly satisfactory 

JC 8.3 Level of improvements in ESG achievement

No negative ESG issues have been encountered in project reporting documentation or during the field visits. An initial ESIA was prepared although it was clear that further detailed work would be necessary post-tender when detailed design was finalised as locations and line of a number of proposed facilities had still to be fixed. ESMP estimated costs were originally estimated as low and more detailed costing was undertaken when the ESMP was prepared which detailed all activities, time schedules and budget. Impacts considered in the ESIA and ESMP cover impacts during construction, operation and demolition of the installations at the end of the installations' technical life. Mitigation of impacts was handled in conformity with the Mozambican legislation (MICOA) in line with the World Bank's guidelines.

Resettlement is particularly important and was discussed in detail with MICOA. In case of resettlement and compensation of people living in the corridor national legislation in line with WB's guidelines applied. It was the responsibility of EDM to finance compensation as well as other costs related to obtaining the ROW, such as demining.

Another aspect of mitigation could be that the people impacted might benefit from the new infrastructure. In this project persons living near the line corridors for Lindéla – Massinga and Maxixe – Massinga should already have the possibility of supply since MV-lines and a substantial number of small distribution transformers had been included in previous Danish-financed projects in the area whilst there were expected to be direct benefits associated with the two rural electrification components.

JC Rating – Satisfactory 

EQ 8 Overall Rating – Partly Satisfactory

At Appraisal an independent economic analysis was carried out which concluded that the project was economically viable (although financially non-viable).

Considering the project's poverty alleviation dimension the rural electrification project in the reinforcement of supply in Gaza and Inhambane provinces was considered to be of high priority. However, the project as a whole consists mainly in reinforcing and expanding the backbone of the Mozambican power system, which is indispensable for the continued and equal economic growth of the country. Reliability of power transmission and distribution is essential for companies and private consumers for their business and social needs. In Mozambique where the transmission system mostly transports hydro energy from Cahora Bassa distribution and transmission reliability and sufficiency is particularly important.

The project fulfils the criteria for Danish support because of its importance for poverty reduction through sustainable economic development as one of the pillars of Mozambique's PARPA. The project fulfils the condition of being economically viable whilst not being financially viable (i.e. commercial financing not possible). DSIF support included a grant element covering interest etc. amounting to 50% of the total cost of the project value. The project was assessed for financial viability "after DSIF support" (i.e. the financial viability of the projects was re-assessed when the grant and subsidy elements were taken into account) thus improving FIRR across all components. A sensitivity analysis showed that the projects were fairly insensitive to increases in investment costs and to variations in the volume of sales but to the contrary an increase in the costs for energy had an important impact on the FIRR.

Overall, it can be concluded that the total project was non-financially viable (i.e. not expected to be able to attract commercial financing) while it was economically viable but it would be necessary for EDM to support a total negative cash flow. For EDM to be able to operate and maintain the existing system it was estimated that a tariff increase of 35% would have been required in 2015, followed by inflation level increases to cover O&M only.

Overall there is a continuing story of lack of EDM financial viability in part arising from GOM policy to keep down electricity tariffs to an affordable level. That being said, it is reported that policy dialogue in relation to potential poverty alleviation effects of the investment was an integral part of the policy dialogue during project preparation, including in well-established sector working groups on environment and electricity supply together with government and other donors. This dialogue dealt with risks associated to tariff policies, regional cross-subsidies, company structure – including transfer pricing – and it impacted on both project design and company policies. It assured that the investment actually benefits poor people and that subsidy in project finance is transferred to poor consumers through tariffs and project design and not wasted or creamed off to other entities

No negative ESG issues have been encountered in project reporting documentation or during the field visits.


EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
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JC 10.1 Quality of risk management systems and policies on long-term sustainability

At Appraisal risks, assumptions and mitigation measures as identified at Feasibility were reviewed as summarised below - there were no references to a logical framework or SDGs.

- World financial problems: the concern was the extent world market fluctuations might impact major industries and the investments, particularly in the Beloluane Industrial Park
- Availability of electricity: adequate power generation was considered a pre-requisite
- Construction prices: extremely important because of the long lead times.
- Delayed payments: in order to avoid transaction costs and to ease payment procedures the sums due to the contractor and consultant were not transferred to Banco de Mozambique but remained in the Danish.
- Resettlement and compensation.
- Supply of major equipment:
- Consultant's experience & h) Project Manager replacement: given that EDM will be in control throughout implementation the importance of limiting those eligible as Engineer as indicated as well as the importance of project manager replacement seem somewhat exaggerated given the international experience of Norconsult/Vattenfall appointed to undertake design, tendering and supervision (contract signed 2011).

Given the actual contractual outcomes involving contract disputes and claims the observations on potential issues arising from issues of access to the site were correctly identified.

JC Rating –  Satisfactory – main risks were identified and assessed appropriately.

JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

Monitoring and Progress Reports have been produced at approximately 6 monthly intervals from N° 1 08/05/2014 to N° 11 10/12/2019 and most recently QPRs Oct-Dec 2020 [Phase II Main Package, Phase IV (OP1) and Phase V (OP2)]. These reports are of standard format and consist of conventional construction contract monitoring of progress following (more or less) the specified output indicators i.e.

- 120 km of 275 kV line Corumana SE – Lionde SE commissioned inclusive of necessary extensions in the two substations
- 110 km of 110 kV line Lindéla SE – Massinga SE commissioned inclusive of the new Massinga SE and necessary extensions in Lindéla SE
- 70 km of 33 kV line Maxixe SE – Massinga SE inclusive of extensions to Maxixe SE
- 46 km of 33 kV line, 12 distribution transformers, LV networks to connect 2 administrative posts, 10 villages, 12 schools, 5 clinics and 7.073 household connections.
- Extension by a 400 MVA transformer in Maputo SE inclusive of necessary extensions to the substation
- Extension by a 50/50/20 MVA transformer in Quelimane SE inclusive of necessary extensions in the substation
- Extension by a 40 MVA and a 16 MVA transformer in Chimuara SE inclusive of necessary extensions in the substation
- Extension by a 100/100/33 MVA transformer in Alto Molocue SE inclusive of necessary extensions in the substation
- Extension by a 35 MVA transformer in Nampula Central SE inclusive of necessary extensions in the substation
- Extension of Maputo SE by 2 x 120 MVA transformers to supply Beloluane industrial Park inclusive of necessary extensions to the substation
- One lot of spare parts supplied
- Team of EDM staff trained in maintenance for lines, substation and SCADA
- STD (inclusive of HIV/AIDS) awareness campaigns conducted for villagers along the transmission lines and condoms distributed (calculated as one of session per 10 km as well as appropriate number of campaigns for contractor's own staff)



In addition, draft and partial verification reports (at expiry of defects notification period and take over) have been produced which are the basis (as snag lists) for contractor remediation. The most recent verification reports are dated mid-2019. This implementation work is only now coming to an end (due, in part, to logistical difficulties arising from the Covid pandemic). Overall, output reporting is of high quality.


Outcomes were characterised at appraisal as '*... more complex to monitor, as it can be difficult to separate the project's outcome from the outcome of other activities*'. Thus instead of monitoring general socio-economic parameters a decision was taken '*to focus on outcome that has close link with the project*'.

The following outcome indicators were specified (which refer only to performance of some project outputs):

- Line unavailability in percent of time of maximum 0,1%, to be calculated at the end of first year of operation, for Macia and at Massinga.
- Unserved energy of 0,75% maximum, to be calculated at the end of first year of operation, for Macia and at Massinga.
- Growth in energy transmitted to the project area in line with GDP growth.
- Development in peak load compared to the load growth forecasts for the different areas in the Gaza and Inhambane provinces as well as for the Beloluane Industrial Park.

Monitoring of outcomes should be undertaken by EDM yearly during the five years following commissioning and should be reported to the Secretariat for Mixed credits. Given that the project implementation is only now coming to an end (covid restrictions having delayed snagging and finalisation) no outcome reporting has yet taken place. However, whilst it is accepted that EDM may not be best positioned to monitor socio-economic parameters, it is suggested that EDM could readily monitor outcome indicators relating to the two rural electrification components (e.g. population gaining access to the grid, consumption (business and households), revenues, tariffs).

JC Rating – Partly satisfactory 
<p>EQ 10 Overall Rating – Partly satisfactory </p> <p>Analysis of risks, assumptions and mitigation measures is of high quality and in terms of issues and constraints which have arisen during implementation the analysis has been proven to be prescient (and yet a number of the flagged risks have nevertheless resulted in delays and claims for additional payment to the contractor thus suggesting that mitigation measures were not entirely effective). Given the actual contractual outcomes involving contract disputes and claims the observations on potential issues arising from issues of access to the site were correctly identified.</p> <p>Implementation and output reporting has been scrutinised for the entire implementation period i.e. Monitoring and Progress Reports have been produced at approximately 6 monthly intervals. These reports are of standard format and consist of conventional construction contract monitoring of progress following (more or less) the specified output indicators. The reporting appears to have been timely and of good quality concentrating almost exclusively on implementation activities, progress (physical and financial), outputs, quality and contractual issues. In addition, draft and partial verification have been produced which are the basis (as snag lists) for contractor remediation. This implementation work is only now coming to an end (due, in part, to logistical difficulties arising from the Covid pandemic). Overall, output reporting is of high quality.</p> <p>Outcomes were characterised at appraisal as ‘... more complex to monitor, as it can be difficult to separate the project’s outcome from the outcome of other activities’. Thus instead of monitoring general socio-economic parameters a decision was taken ‘to focus on outcome that has close link with the project’. Thus, the specified outcome indicators refer only to performance of some project outputs). Monitoring of outcomes should be undertaken annually by EDM for five years following commissioning and should be reported to the Secretariat for Mixed Credits. Given that the project implementation is only now coming to an end no outcome reporting has yet taken place. However, whilst it is accepted that EDM may not be best positioned to monitor socio-economic parameters, it is suggested that EDM could readily monitor some outcome indicators relating to the two rural electrification components (e.g. population gaining access to the grid, consumption, revenues, tariffs).</p>

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
<p>The quality and appropriateness of the RMS is high as regards outputs and implementation, less so as regards outcomes.</p> <p>Monitoring and Progress Reports have been produced at approximately 6 monthly intervals of standard format and consist of conventional construction contract monitoring of progress following (more or less) the specified output indicators. Also verification reports (at expiry of defects notification period and take over) have been produced which are the basis (as snag lists) for contractor remediation.</p> <p>Outcomes were characterised as ‘... more complex to monitor, as it can be difficult to separate the project’s outcome from the outcome of other activities’. Thus instead of monitoring general socio-economic parameters a decision was taken ‘to focus on outcome that has close link with the project’ and all the specified outcome indicators refer to performance and usage of project infrastructure. There are no development outcome indicators as such. Monitoring of outcomes should be undertaken by EDM yearly during the five years following commissioning and should be reported to the Secretariat for Mixed credits but, as project implementation is only now coming to an end no outcome reporting has yet taken place. Whilst it is accepted that EDM may not be best positioned to monitor wider economic or socio-economic parameters, it is suggested that EDM could readily monitor some outcome indicators relating to the two rural electrification components (e.g. population gaining access to the grid, consumption (business and households), revenues, tariffs).</p> <p>See also 10.2 above regarding the specified output and outcome indicators.</p> <p>JC Rating – Partly satisfactory </p>	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
<p>The Project Monitoring Indicators set out at Appraisal Stage have been broadly followed as regards outputs (actual monitoring reports go into considerable detail under each item of work such that the specified outputs are not necessarily exactly followed). However, given that the implementation is only now coming to an end no reporting of specified outcome indicators has yet taken place. There is little or no monitoring of outcome development indicators and no analysis has been made of lessons learned.</p>	

Specified Monitoring Indicators

Outputs

The outputs listed in 10.2 were simple to monitor and consists of verifying the following against the project documents, at the time of commissioning:

Outcomes were characterised at appraisal as ‘... more complex to monitor, as it can be difficult to separate the project’s outcome from the outcome of other activities’. Thus instead of monitoring general socio-economic parameters a decision was taken ‘to focus on outcome that has close link with the project’.

The following outcome indicators were specified (which refer only to performance of some project outputs):

Outcomes

- Line unavailability in percent of time of maximum 0,1% to be calculated at the end of first year of operation, for Maci and at Massinga
- Unserved energy of 0,75% maximum, to be calculated at the end of first year of operation, for Macia and Massinga
- Growth in energy transmitted to the project area in line with GDP growth
- Development in peak load compared to the load growth forecasts for the different areas in the Gaza and Inhambane provinces as well as for the Beloluane Industrial Park

The specified monitoring indicators for outputs have been largely reported upon, consisting almost entirely of completed activities and/or delivery of outputs. Outcomes as specified are expected to be reported upon by EDM for the coming 5 years but these largely concerned with monitoring of performance of the outputs and contribute little to identification of development outcomes – not even some expected development outcomes of the rural electrification component (which would be expected to be readily measurable) are mentioned. Given the limited scope of specified outcome indicators it is suggested that IFC Power Indicators¹²² (as set out in JC 6.2 above) could better identify and document outcomes (although the issue of the competence of EDM to furnish such monitoring information should be borne in mind)

JC Rating – Partly Satisfactory 

EQ 11 Overall Rating – Partly Satisfactory

The RMS concentrated only on implementation activities and progress. Output indicators relate to project infrastructure delivery whilst identified outcome indicators refer only to technical performance of outputs. No monitoring of development outcomes has been scrutinised by the evaluation (because the project is only now being finalised and such outcomes are not yet available), however no outcome development indicators as such have been identified, not even for the rural electrification components for which some such outcome monitoring information should be readily available to EDM) and no ex-post analysis has yet been carried out.

¹²² IFC Anticipated Integrated Measuring and Monitoring (AIMM) Power Sector Framework – March 2019
<https://www.ifc.org/wps/wcm/connect/9f89e8f3-62fd-4af0-9c23-3c59f74a2630/AIMM-Power-Consultation.pdf?MOD=AJPERES&CVID=nmTfdlr>

Field visits and calls





14.1.1 Introduction

The field mission took place from March 25th to April 25th, 2021 in Maputo, Gaza and Inhambane provinces

People met: Aulino Cuambe (Norconsult), Arone Malendsa, Cristiano Calege (EDM HQ), Gaza and Inhambane Provincial heads and Substation supervisors - See annex 1 for the full list

Places Visited: Ressano Garcia 275 Substation, Maputo 275 Substation, Zimbene (Macia) substation, Lindela Substation, Massinga Substation, rural electrification in Homoine and rural electrification in Chibuto

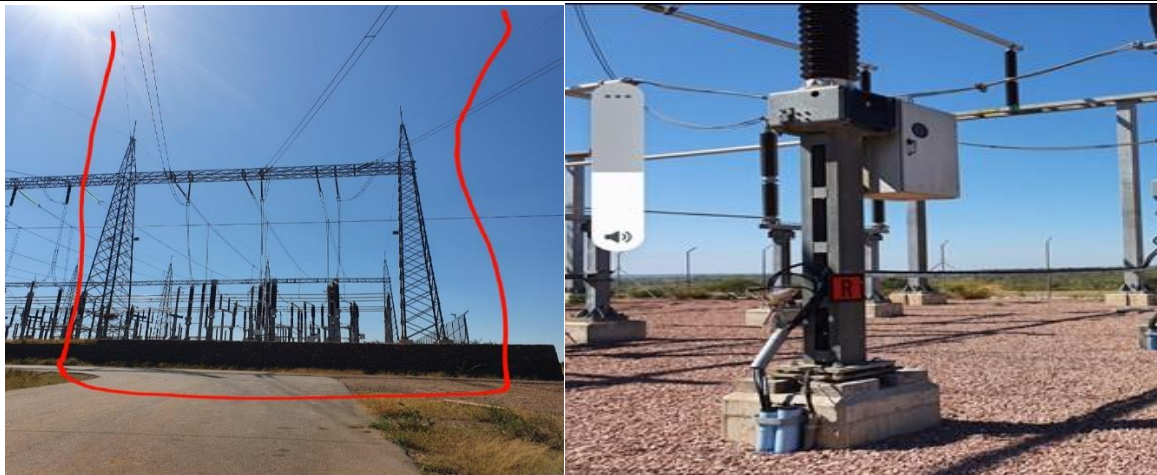
Institutions interviewed: EDM (at national and local levels) and Norconsult (Consulting firm).

During the field visits (undertaken by José Chiburre, facilitated by Paulino d’Uambo) between 25/03/2021 and 25/04/2021 meetings were held with Norconsult, EDM (HQ, Gaza and Inhambane Provincial heads and Substation supervisors. Locations visited: Ressano Garcia 275kVA Substation, Maputo 275kVA Substation, Zimbene (Macia) substation, Lindela Substation, Massinga Substation, rural electrification in Homoine and rural electrification in Chibuto

Ressano Garcia Substation (275 KVA) – BL5



Burnt out circuit Breaker (disruptor) Unit¹²³



Circuit Breaker Replaced (left) Unit (BL5) constructed with Danida funding (right) leading to Zimbene

New 250 MVA, 275/110 kV substation at Zimbene

¹²³ The reason for the circuit breaker malfunction is not known (i.e. faulty equipment or faulty operation) ?



Zimbene Substation (Macia)

Figure 1: Earth switches not aligned

Rehabilitation and upgrade of Lindela Substation



Lindela Substation; Switch placed where it is difficult to manoeuvre

Construction of a new 30 MVA, 110/33 kV substation in Massinga



Massinga substation; Switch placed too high, making it difficult to manoeuvre

Rural electrification in Homoine



A split meter (left) and a transformer (right) in Homoine district

Chibuto district



Rural electrification in Muxaxane - Chibuto (Power line on the left and integrated meter on the right)

Second Optional Package, OP2



Maputo 275 Substation; The four 66Kv exit lines of Maputo 275

It is important to note that Danida was interested in funding the transmission work, but KfW also wanted to fund the same project. So Danida and KfW negotiated to allocate their funding to different section of the work (substation for Danida and transmission for KfW)

14.1.2 Findings

14.1.2.1 Working with Danida

Under the inter-government relationship, the government of Mozambique presented to Danida a proposal of areas that required financial support. Given the electricity deficit, high demand and the EDM vision to expand its power grip the Reinforcement and Extension of National Power Transmission Grid was proposed.

Danida was open to fund the project, through “Danida DSIF” and the appraisal, EIA and consultation process were undertaken. The whole process was approved and did not take long.

The project was designed in 2011/2012. It included the Main package and three optional packages. The implementation started in 2014.

An international tender was launched and a consortium of Per Aarsleff/Seth, led by Aarsleff (Danish company) won the tender.

Danida showed professionalism and seriousness straight from the beginning. The process of financing conception, tender and commissioning was carried out in three months and the process was transparent.

Danida were very easy to work with, serious and always available to help.

The capacity building aspect for EDM staff could have been dealt with in a different perspective. EDM technicians have the capacity to do their job but they are not certified. Because they are not certified, they cannot work at the MOTRACO substation. On the other end, EDM would like to be a Regional Pillar, but though they have the capacity, the staff is not certified in protection, heavy maintenance, transmission lines – for example the transmission lines these days carry optic fibre / telecom and EDM staff need to be certified and allowed to operate at that level.

In 1983, Sweden Power trained EDM staff in Sweden for 4 months and they were able to boost EDM capacity in general and operate abroad. Some of these staff are now directors and not technician / simple Engineers or operators. Therefore, there is no certified capacity at operational level.

In the end, all went well as the work finished within the planned timeframe, except for the commissioning of Maputo 275 (done in April 2021) and the SCADA / Telecom, which has not yet been done.

14.1.2.2 The Main Package

This was meant to supply electricity in Gaza and Inhambane provinces, and consisted of:

- Extension of the Ressano Garcia Substation (275 KVA) – BL5 to Zimbene
- Construction of 50 km transmission line from Ressano Garcia (Maputo) to Zimbene (Macia district in Gaza Province)
- A new 250 MVA, 275/110 kV substation at Zimbene.
- Rehabilitation and upgrade of Lindela Substation
- Construction of 110 kV transmission line from Lindela to Massinga,
- Construction of a new 30 MVA, 110/33 kV substation at Massinga
- Construction of 33 kV transmission line from Massinga to Maxixe, making Maxixe connected to two lines, one from Lindela and the second one from Massinga
- Rural electrification in Homoine district Headquarters neighbourhoods (7 de Setembro and 3 de Fevereiro Neighbourhoods) Chibuto district (Muxaxane and Uhamuza Neighbourhoods), with a total network of 46km (power line), connecting about 5,000 clients.

The Main package was completed.

Extension of the Ressano Garcia Substation (275 KVA) – BL5

Part of the substation supplying Zimbene (BL5) was constructed with project funds. In this part constructed by the project the whole circuit breaker (Disjuntor) unit burnt out sometime after being established. The remaining of the circuit Breaker are still in the substation. See the pictures of the burnt out circuit breaker and the replacement below. Currently all is functioning well.



Burnt out Circuit Breaker (disjuntor) Unit



Circuit Breaker Replaced (left) Unit (BL5) constructed with Danida funding (right) leading to Zimbene

A new 250 MVA, 275/110 kV substation at Zimbene



Zimbene Substation (Macia)

- The substation has two 250MVA transformers. One is functioning and the other one is not because it is not connected. EDM has designed a project to connect the second transformer.
- The earth switches are not aligned; hence they can only be operated manually and not electronically as it was supposed to be, placing the operator in danger.



Earth switches not aligned

- Premature corrosion of the transformer. The transformer was painted last year, but it corroded again
- The telecom system has not yet been commissioned, so the substation cannot be operated remotely and visualization of information from the screens (computers) is faulty.

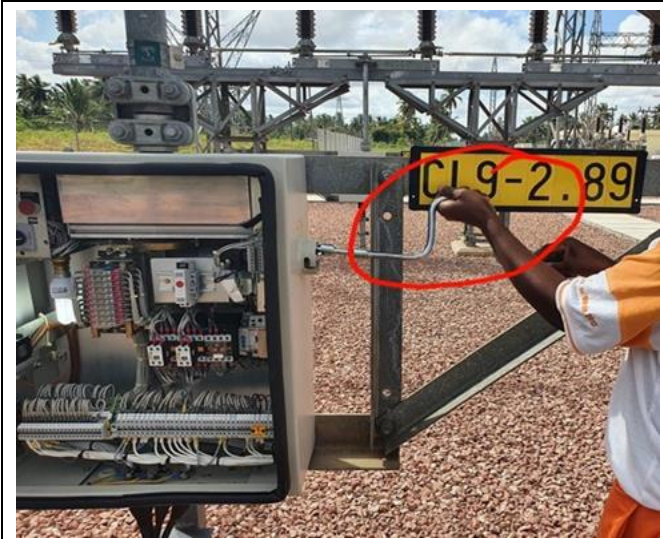
Rehabilitation and upgrade of Lindela Substation



Lindela Substation

- SCADA/Telecom system not concluded. This has been a problem from the beginning. All problems associated with SCADA/Telecom persist - The PLC supposed to communicate with both Chicumbane and Massinga, but it only communicates with Massinga.
- There is a problem with the 110 kV switches. These are operated manually and the way the handles are placed poses danger to the operator. The handles are placed in a position that creates difficulties for the operator to move them. The way they are positioned the operator

could be forced to interrupt the manoeuvre before finishing the course, putting him in danger. See the figure below.



Switch placed where it is difficult to manoeuvre

Construction of a new 30 MVA, 110/33 kV substation in Massinga



Massinga substation

- The Massinga substation supplies electricity to Maxixe, Funhalouro, Vilanculos, Mabote, Massinga and Morrumbene
- SCADA / Telecommunication system's installation not concluded.
- The circuit breaker is placed in such a way that it is not possible to isolate it, even if there is a problem. Under normal circumstances one would have a circuit breaker between switches, but in the case of Massinga a transformer then the circuit breaker and bus (Barramento)
- The earth switches are operated manually and are too high than the recommended 1.5 meters, making it difficult for the operator to manoeuvre.



Switch placed higher, making it difficult to manoeuvre

Rural electrification in Homoine (7 de Setembro and 3 de Fevereiro Neighbourhoods) and Chibuto (Muxaxane Locality and Uhamuza Neighbourhood) districts

A total of 46km power line, connecting about 5,000 clients.

Homoíne district

A total of 13 transformers (2 with 160kV and 11 of 100 kV) were installed, one at the headquarters in Inhambane and the other 12 in Homoine district HQ benefiting two neighbourhoods (7 e Setembro and 3 de Fevereiro).

The electricity connection occurred during the period when the government was implementing the project named "LIGA LUZ" which promoted the household electricity connection. Hence the price to connect electricity to the household was low, at 875 MZN.

In Homoine split meters are been installed, and it is believed that they are safe as the smart meter is installed at the electricity post. According to EDM staff, there are no cases of theft, electricity by-pass or users stealing electricity as it is not easy to do so with split meters.

Interviews were carried out with two categories of users: those using electricity for *household consumption* and those using for *small business*. It was revealed that:

- The quality of the electricity is good and there are no frequent power cuts
- The tariffs differ depending on the category of the user. The tariffs for household users is about 8 MZN / kw and about 14 MZN for small business users. In general, the price for both categories is affordable.
- For small business users the first electricity purchase in a month has three categories: a) purchase of 0-100 kw which is cheap, b) 100 – 200 kw which is relatively expensive and c) above 200 which is more expensive than the first two.

The users can purchase electricity remotely (using their mobile phones) or from the shop or EDM outlet.

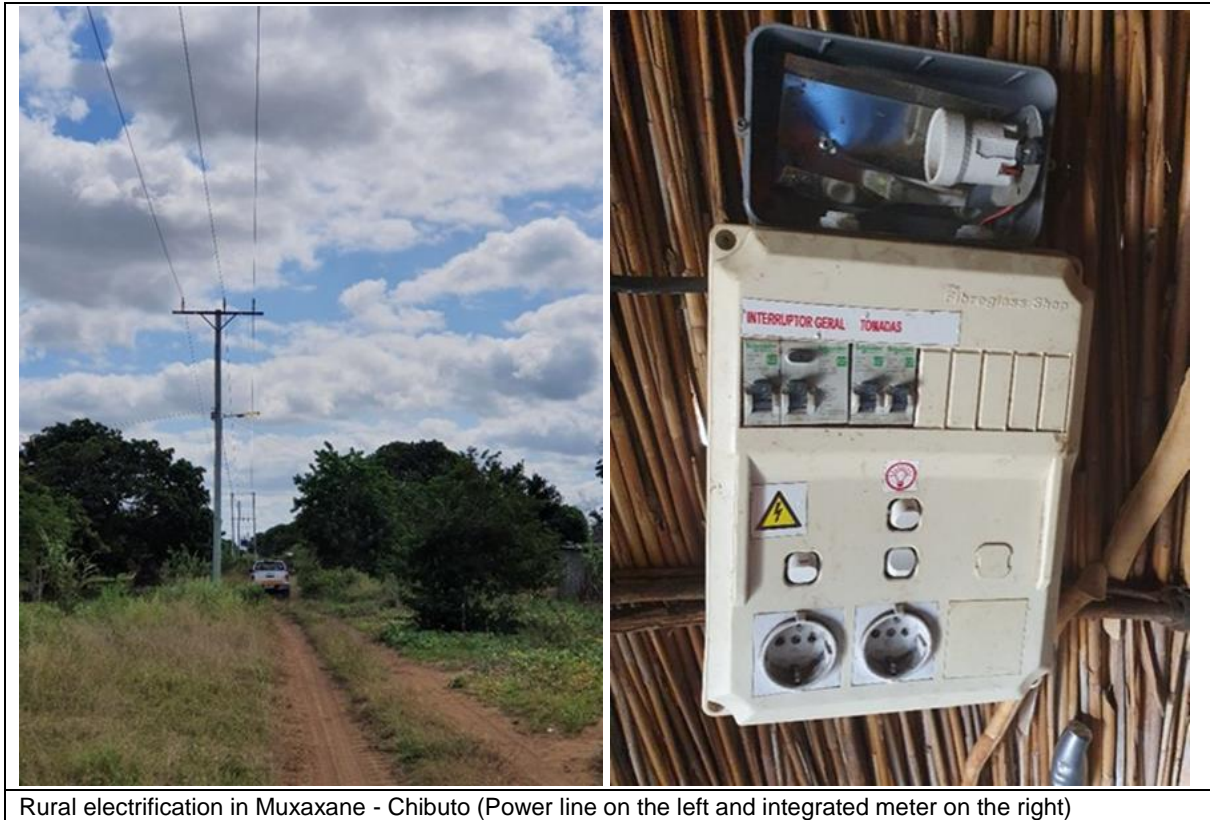


A split meter (left) and a transformer (right) in Homoine district

Chibuto district

In Chibuto, two localities (Muxaxane and Uahamuza) benefited from rural electrification.

- In Muxaxane five neighbourhoods have been connected to the grid by the project since June 2016.
- The beneficiaries use “integrated meters”. However, EDM is gradually replacing the integrated meters with split meters – so whenever a client has a problem with the integrated meter, the old meter is replaced by the split meter.
- Some users connected electricity before LIGA LUZ project and paid 3,500 MZN per household connection. Later the LIGA LUZ project was implemented, and users who connected electricity under the LIGA LUZ project paid 875 MZN. Currently, its free to connect electricity in Mozambique as the government is promoting electricity connection countrywide.
- In Nguetsemene area, the electricity cable is low because one post was knocked down by a vehicle two years ago and it has not been fixed yet.
- There are some problems in Muxaxane. During the field visit many users came to us complaining over different kinds of problems. The common one was that after the electricity units finish, when the user buys units they cannot be recharged. The EDM technician from Xai-Xai (Gaza province HQ) who accompanied me to the field tried to fix some problems reported during the visit, and it was not possible. He promised the users to send a team to help them solve their problems. Given that the users have been facing those problems for long time, it means that EDM technical assistance is weak, especially in Muxaxane.



Rural electrification in Muxaxane - Chibuto (Power line on the left and integrated meter on the right)

14.1.2.3 First Optional Package, OP1:

- Reinforcement of Chimuara Substation: Installation of two transformers. One with 80MVA – tension: 220/110 and the second with 16 MVA – tension 110/33 kV
- Extension and upgrade of Quelimane Substation: Installation of 50 MVA transformer – tension 220/33
- Alto Molócuè: Installation of 100MVA transformer – Tension: 220/110/33. In alto Molócuè all the control system was replaced with Danida funding.
- Nampula Central: Installation of 50MVA transformer; rehabilitation of the control and protection systems and provision of supporting/auxiliary services e.g.: batteries

OP1 was finalized in August 2020.

However, there are few problems:

- With the fire sensor in one substation (to be identified). The alarm rings anyhow, without there being any problem
- Rust in some parts of the installed equipment

The contractor (ABB) has already been notified, but could not come from South Africa due to COVID. Now that the borders are opened, it is expected that the contractor will come to fix the problems above. ABB was subcontracted as Substation designer and supplier, while EI-Tel was subcontracted as transmission line designer and supplier, the capacity Aarsleff did not have. Seth was responsible for distribution, while Technel/Moko was Erection subcontractor for connection of cables. Voltageon (from South Africa) was contracted to do the testing and commissioning after technel/Moko was completed.

14.1.2.4 Second Optional Package, OP2:



Maputo 275 Substation

- Construction of a new substation in Matola (**Maputo 275**) for power supply to Beluluane Industrial Park (275/66kV) with two 120 MVA transformers. The substation is side-by-side with MOTRACO substation which supplies MOZAL.
- The substation has four (04) 66kV exit lines / power supply points to supply Boane district, Infulene and the Beluluane Industrial Park. and associated equipment.
- The Substation was commissioned early April while the evaluation was underway. Although the tests were done in 2019, the commissioning was not done due to COVID. Only now that travel restrictions have been lifted, the contractor (Voltageon) and Eskom (in representation of MOTRACO) from South Africa could finish the work.
- While Maputo 275 was commissioned and its now active, it still cannot supply electricity because the transmission work funded by KFW is still underway and it will be finalized next year. Eventually, Maputo 275 will be operational from 2022.
- It is important to note that Danida was interested in funding the transmission work, but KFW also wanted to fund the same project. So Danida and KFW had to negotiate between themselves and allocate their funding to different section of the work (substation foe Danida and transmission for KFW)



The four 66Kv exit lines of Maputo 275

14.1.2.5 Third Optional Package, OP3

The objective of OP3 was to install a transformer within the MOTRACO substation. EDM opted for constructing its own substation, so EDM requested for the cancellation of OP3.

14.1.2.6 Settlements and compensations

EDM was responsible for settlement and compensation of affected people. EDM used the national rules and regulations applied for settlement and compensations. At first people did not understand, but EDM explained several times and the affected people later understood how such situations should be dealt with.

EDM had set aside money to pay the affected people and all ended well.

14.1.2.7 Claims

Danida was clear from the beginning that no claim was going to be paid through its funds – Danida did not budget for claims!

There were more than 50 claims due to delays, demobilization and mobilization. Because of EDM internal procedures to release funds some payments were delayed, and EDM had to make a plan for payment of claims, and all the claims were resolved.

14.1.2.8 Changes

- The appraisal was done in 2009/2010 and the implementation started late. This meant that things had changed in some areas, for example:
- There were areas planned for rural electrification, which by the time the implementation of the project started, the areas already had electricity. For example initially the plan was to expand the rural electrification of Maxixe and Massinga. By the time the project was implemented these areas had electricity and were replaced by Homoine. Therefore, the scope changed slightly, especially on expansion of the electricity grid. EDM presented the proposed changes to Danida and the changes were approved.
- The deviation of the transmission lines to pass through Zimbene substation, instead of Lionde SS. This deviation of the transmission lines was meant to make the Zimbene Substation

operational and increase Zimbene capacity to attend to the demand of Chibuto Heavy Sand Project.

- There were changes for all substations that existed before the project, because while during the appraisal all was fine with the substations, during the implementation most SS had the protection damaged
- In Chimuara there was a need to construct new protection,
- In Nampula there was a need to expand the platform for about 15m to have enough space for the new transformer
- **In OP2:** MOTRACO contract with MOZAL was to supply 132 and EDM 66. EDM instead of expanding its capacity within MOTRACO SS, it decided to build an independent substation adjacent to MOTRACO, in fact few meters away from MOTRACO SS.
- Even with all those changes there was no need for Danida to provide additional funding as the cost of the changes were covered by the amount set for contingencies.
- From the total budget, there are some funds left, which could be used for changing the reactor for the Matambo substation, and Danida approved the use of the remaining funds as it has huge interest in helping out EDM. The contractor is expected to present the quotation for Matambo substation.

14.1.2.9 Use of FIDIC Yellow from 99

This was the adequate and ideal and all agreed to use FIDIC Yellow 99. Now there is 2017/2018 version, but this still need to be studied and analysed.

FIDIC Yellow 99 is a good manual because it allows you to alter and add especial /particular conditions of the contract. It's fairly flexible.

14.1.3 Conclusions

- There is a good perception / feeling of working with Danida
- The time between the appraisal and implementation long
- As soon as the project started, the implementation was quick and the infrastructure development work finished in time. Other works e.g. commissioning of Maputo 275 though finalized earlier, was done in April because of travel restrictions imposed by governments due to COVID.
- SCADA /Telecom has not been commissioned yet, and there are complaints from the operators at the substation due to non-functionality of the Telecom
- The fact that the transmission lines for the Maputo 275 is done by another donor (KFW) seem to have delayed the operationalization of the Maputo 275
- Some construction / structural deficiencies have been observed, ex: the placement and position of the earth switches and their lack of alignment; the fact that the circuit breaker (disjuntor) in Massinga SS cannot be isolated seem to be a serious problem.

Case study: Pakistan

15 Pakistan: Faisalabad Wastewater Treatment Plant

Overview

<i>Key issues, highlights and lessons learnt</i>
<p>Current Sanitation Situation in Faisalabad</p> <p>The Faisalabad area has a hot desert climate with an average annual rainfall of only 375 mm. The area experiences a chronic shortage of water and Water & Sanitation Agency (WASA), has started exploiting surface water resources for drinking water purposes due to over-exploitation of groundwater resources. Pollution levels of these resources are high due to discharge of untreated wastewater into the environment. The growth of Faisalabad (population 3,2 million) has been unplanned, and industrial units and residential areas are highly mixed in the city. WASA is responsible for both water supply and sewerage services in the zones of East and West constituting the city. Faisalabad has currently a de-facto combined collection system where wastewater and storm water are together collected and eventually discharged into large drainage channels and led into the rivers Ravi (eastern catchment) and Chenab (western catchment). Industry accounts for 70 percent of wastewater in the eastern part of Faisalabad. In most cases, industrial effluent is discharged into the sewer system, as very few industries have on-site pre-treatment facilities. The Government of Punjab has established an industrial zone outside the city with the aim of moving most industrial enterprises from the city centre to this area. The industrial zone will have its own wastewater treatment plant. This relocation is progressing slowly and may take another 10 years or more. Presently, there is only one, by international standards very inefficient, wastewater treatment plant that treats less than 10 percent of the wastewater in the Western zone of the city. All domestic and industrial wastewater from the eastern zone remains untreated and flows in to two channels: Channel No. 4 and Satiana Road Channel. Thus there is a massive contamination of rivers, which are sources of downstream water supply and irrigation.</p> <p>Channel no. 4 collects wastewater from an estimated 765.000 people and commercial, institutional and industrial establishments and leads the water into Madhuana Drain which eventually is led directly into the river Ravi and ultimately the Indus River. Farmers along the Channel No. 4 use the highly contaminated wastewater as irrigation for their agricultural production, including food crops, thereby preventing treatment of polluted wastewater, contaminating agricultural products and polluting the groundwater.</p> <p>The 2018 feasibility study estimated that from all drainage channels in Faisalabad app. 1.000 ha of agricultural lands are irrigated with polluted wastewater. Part of the project is to cover Channel 4 in concrete slabs preventing access to the wastewater in the channel. In parallel to the project the Irrigation Department will work with the farmers on providing groundwater from new wells in the area.</p> <p>The industrial and commercial tariff was revised in 2016 but domestic tariffs have been frozen from 2006 to 2018. On several occasions, WASA has requested the Government of Punjab to increase the domestic tariff due to ever increasing power bills. Instead, the Government of Punjab has provided annual subsidies. These subsidies are a drain on province government budget and remain insufficient to cover full service delivery so it must be concluded that not only are current tariff levels too low for financial sustainability so also is the current 'balance' of tariffs and subsidies. The project will treat 200.000 m³ of wastewater per day and includes the covering of Channel No. 4 to prevent the illegal extraction of raw wastewater for agricultural purposes before the water is treated, thereby reducing the pollution of crops and groundwater.</p> <p>Energy recovery will be ensured via biogas production and combustion. The total electricity generated by biogas plant to be constructed is prudently estimated at 50% of the total electrical power required for treating 200.000 m³ /day of wastewater. Treated effluent from the WWTP will be channelled through a new pipeline to the Gogera Irrigation Branch Canal and used both for irrigation purposes and as raw water for the planned AFD financed surface water treatment plant. The WWTP will be designed with considerable flexibility due to the change in characteristics and flow expected over the design horizon of the works. The Faisalabad authorities has prohibited the location of new industrial companies in Faisalabad city and are trying to move existing companies to establish themselves in a new industrial zone outside of Faisalabad. When industries do move out from the city catchment, the wastewater will change from a mixture of domestic wastewater and industrial (especially textile) wastewater to a predominantly domestic wastewater, thereby lowering costs of O&M of the waste water treatment plan.</p> <p>During project implementation, farmers will receive advice from the Irrigation Department on how to use alternative water sources (wells) and will be subject to information and motivation campaigns from the Health Authorities, Food Authorities and the WASA Citizen Liaison Cell. In combination with more strict law enforcement efforts planned for 2019, these efforts are expected to stop the illegal practice.</p> <p>Achieving the outcomes and impacts of the project will require a close collaboration and interaction between the main actors such as the Punjab Provincial Government, WASA/Faisalabad, municipal/district health authorities, the district/provincial Environment Protection Agency and users representatives (farmer organisations).</p> <p>The DSIF funded project preparation has been detailed and comprehensive as regards technical and operational issues and indicates expected contribution to higher level development goals. Outcomes and outputs are specified only in terms of technical achievement (e.g. power consumption, throughput of treated water). There is some reference to beneficiary population and how they will benefit (although there is only passing reference to potential health benefits resulting from reduction in water-borne disease which cannot be backed up due to poor public health records). Sustainability risks are identified but possibly underestimated especially as regards risks to financial sustainability which is fully dependent upon tariff reform. Although</p>

commitments have been obtained in this respect the quantum and timescale of such increases required to give reasonable confidence of financial sustainability, such tariff increases may take longer than expected to materialise, given the political sensitivity.

Summary																																											
Project name	Faisalabad Wastewater Treatment Plant																																										
Type of project	WATSAN																																										
Project No.	F2 N°2017-23060, IFU N° L662-1																																										
Description	Wastewater Treatment Plant																																										
Sector	WATSAN																																										
Country	Pakistan																																										
Sponsor	Water and Sanitation Agency – WASA Faisalabad																																										
Other stakeholders	Borrower (guarantor of DSIF loan) – Ministry of Finance, Revenue, Economic Affairs, Statistics and Privatisation (Economic Affairs Division – EAD)																																										
Clearance in principle																																											
Approval/Binding Commitment	March 2019	Loan / Investment Agreement Date	Not yet fixed																																								
Danish Bank	Danske Bank																																										
Loan Duration + Grace Period	10 year tenor. DBF subsidy to cover all interest on loan including bank margins. DBF also provides grant element used to reduce principal loan amount to be repaid by the borrower																																										
Project Amount and funding plan	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Total project budget</th> <th style="text-align: right;">DKK million 1191,00</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">DSIF financing</td> <td style="text-align: right;">DKK million 972,10</td> </tr> <tr> <td style="text-align: left;">DSIF grant commitment</td> <td style="text-align: right;">DKK million 435,80</td> </tr> </tbody> </table> <p>Concessionality 35%</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: right;">Budget (DKK million)</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Output 1 & 5 (Wastewater treatment Plant including biogas facility)</td> <td style="text-align: right;">656,6</td> </tr> <tr> <td style="text-align: left;">Output 2 (Channel 4 cover + connection to WWTP)</td> <td style="text-align: right;">64,9</td> </tr> <tr> <td style="text-align: left;">Output 3 (Operation and Maintenance for 5 yrs.)</td> <td style="text-align: right;">82,1</td> </tr> <tr> <td style="text-align: left;">Output 4 (Connection between WWTP and Gogera Branch Canal)</td> <td style="text-align: right;">149,4</td> </tr> <tr> <td style="text-align: left;">Supervision engineer</td> <td style="text-align: right;">19,0</td> </tr> <tr> <td style="text-align: left;">Total DKK</td> <td style="text-align: right;">972,1</td> </tr> </tbody> </table> <p>Import duties and taxes 218,9 (WASA financing together with costs of EIA and land acquisition)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: right;">DSIF Grant (DKK millions)</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Cash grant element of loan</td> <td style="text-align: right;">144,6</td> </tr> <tr> <td style="text-align: left;">Interest subsidy</td> <td style="text-align: right;">138,5</td> </tr> <tr> <td style="text-align: left;">Margin to Danish lending bank</td> <td style="text-align: right;">12,2</td> </tr> <tr> <td style="text-align: left;">EKF premium (Export loan guarantee fee)*</td> <td style="text-align: right;">116,8</td> </tr> <tr> <td style="text-align: left;">Technical Assistance</td> <td style="text-align: right;">30,0</td> </tr> <tr> <td style="text-align: left;">Budget margin</td> <td style="text-align: right;">110,5</td> </tr> <tr> <td style="text-align: left;">DSIF Total Grant</td> <td style="text-align: right;">552,6</td> </tr> <tr> <td style="text-align: left;">DSIF Grant excl. budget margin</td> <td style="text-align: right;">442,1</td> </tr> <tr> <td style="text-align: left;">DSIF appropriation (excl. EKF premium)</td> <td style="text-align: right;">435,8</td> </tr> </tbody> </table>			Total project budget	DKK million 1191,00	DSIF financing	DKK million 972,10	DSIF grant commitment	DKK million 435,80	Budget (DKK million)		Output 1 & 5 (Wastewater treatment Plant including biogas facility)	656,6	Output 2 (Channel 4 cover + connection to WWTP)	64,9	Output 3 (Operation and Maintenance for 5 yrs.)	82,1	Output 4 (Connection between WWTP and Gogera Branch Canal)	149,4	Supervision engineer	19,0	Total DKK	972,1	DSIF Grant (DKK millions)		Cash grant element of loan	144,6	Interest subsidy	138,5	Margin to Danish lending bank	12,2	EKF premium (Export loan guarantee fee)*	116,8	Technical Assistance	30,0	Budget margin	110,5	DSIF Total Grant	552,6	DSIF Grant excl. budget margin	442,1	DSIF appropriation (excl. EKF premium)	435,8
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Danish Exporter	Danish contractor to be selected																																										
MFA guarantee	Date	Amount	Duration																																								
Implementation status	Construction period expected 2022-2025																																										

Summary	
	Operation 2025-2030 (handover)
Feasibility study details	Mid-January 2018 to September 2018 – covers both western and eastern zones of Faisalabad financed by DSIF Project Development Facility DKK 6,5 million
Subsidy – rationale and key features	DSIF subsidy 35% of contract amount for a Danish contractor (which is composed of an interest free loan from a Danish bank) plus an upfront grant from DSIF. These sums cannot be calculated until a contract is negotiated.
Country Context	<p>Pakistan has a population of 208 million people (130 million below the age of 35) and is the world's sixth most populous country. In recent years, it has achieved continued GDP growth and substantially reduced poverty. Over the last 10 years, the GDP growth has averaged 4,5% with (FY 2017-2018) of 19,6 billion¹²⁴. However, increasing fiscal and external imbalances may erode these gains if not addressed. Macroeconomic, political, and security conditions, natural disasters, and continuing unreliable power supply continue to constrain the country's achievement of poverty reduction and shared prosperity goals.</p> <p>National poverty reduced from 64,3% (2001-2002) to 29,5% (2013-2014) but inequality continues such that Pakistan continues to rank low on the HDI, at 147/188 countries, one of the lowest performances in South Asia, especially in education and stunting (child growth). The GII for Pakistan's was 0,546 in 2015, 130/159 countries. The WB GGI for Pakistan was 0,546 in 2017, 143/144 countries. The WB and IFC "Ease of Doing Business Index 2018" ranked Pakistan 147/190 countries worldwide.</p> <p>Punjab Province plays a vital role in Pakistan's economy. According to the Punjab Economic Research Institute (PERI), from FY 2005/2006 to FY 2015/2016, Punjab has contributed more than half of the country's economic output. The industrial sector is an important component of the Punjab economy, comprising 22,9% of provincial economic output in FY 2015/2016. This industrial sector is also important for employment with 58,1% of Punjab's total labour force employed in the non-agriculture sector, of which industrial production comprises 23,3%¹²⁵. In 2015, Punjab had more than 13.824 factories employing over 1 million people, with Faisalabad having the second largest share of factories, 15,2%.</p> <p>In 2015/2016, the recorded average income level in the Punjab region was higher than the national averages for both urban and rural households¹²⁶. As part of the Feasibility Study, interviews were conducted with farmers in eight villages and a survey of 250 households was carried out. Compared to the national Household Integrated Economic survey (HIES) 2015/2016, the household survey data shows a higher diversity in incomes, with 24% of households interviewed below a monthly income of 16.000 PKR. The monthly average income of 16.000 PKR is just above the living wage for Pakistan for an individual and far below the living wage of a family.</p>

Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>At Appraisal stage it was assessed that the project is compliant with DSIF strategic guidelines despite Danish development assistance to Pakistan being phased out by the end of 2016.</p> <p>By letter of 6th March 2017, the Government of Pakistan, Ministry of Finance, Revenue, Economic Affairs, Statistics & Privatisation (Economic Affairs Division – EAD) submitted a request to the Royal Danish Embassy in Islamabad from the provincial Government of Punjab to consider the financing of a feasibility study for construction of Wastewater Treatment Plants in Faisalabad. After consultations with DSIF in Copenhagen, the Danish Embassy informed EAD that Denmark would proceed further on this matter. It was – and is – the assessment that the project fits well with DSIF strategic guidelines including:</p> <ul style="list-style-type: none"> • Waste water treatment is a prioritised sector where Denmark has competitive solutions to offer to promote the achievement of the SDGs • Pakistan is a partner country to Denmark with important economic and political relations 	

¹²⁴ Source: State Bank of Pakis

¹²⁵ Source: Pakistan Bureau of Statistics, 2017

¹²⁶ The National Bureau of Statistics of Pakistan does not have data available on income, expenditure and poverty levels separately on city or district level, but only for Punjab regional level divided by rural and urban population.

On November 15, 2017, a memorandum of Understanding was signed between the Government of Punjab through the Water & Sanitation Agency (WASA), Faisalabad and the Danish Embassy in Islamabad on collaboration between the Pakistani and Danish governments on an important wastewater treatment project in Faisalabad.

Danish Pakistani Context

Danish – Pakistani diplomatic relations date back to 1969, when Denmark opened its Embassy in Islamabad. Over the years, Danida has supported Pakistan in the areas of Education, Human Rights, Gender Equality, Democratization, Peace and Stability – often with NGOs or UN agencies as implementing partners. The latest support programme (DKK 229 million), which built on previous support from 2010 to 2012, was provided through a 2013-2016 programme to peace building, livelihoods, education and to civil society organisations with a clear rights mandate in the areas of democratisation, human rights and gender equality. Danish development assistance to Pakistan was phased out by the end of 2016, but the Danish Refugee Council, Danish Red Cross and International Media Support continue their activities in the country under framework agreements with the Ministry of Foreign Affairs in Denmark.

Danida, like many other international donors has been implementing water and sanitation facilities in developing countries over the last 40 years. Statistics on basic health indicators from local health centres are often non-existent or very scarce, and thus no scientific proof shows that improved water and sanitation facilities alone lead to improved health of the benefitting population. In surveys the beneficiaries, clearly state that they experience improved health when sanitation is improved. Piped water supply and sewerage facilities to households in urban areas improves environmental and sanitary conditions e.g. studies demonstrate that nuisance from mosquitos and flies is strongly reduced. Further, the unhealthy mixture of sewerage water with rain water is eliminated during the rainy season.

In 2015, Denmark decided to end the bilateral development assistance to Pakistan by phasing out the Pakistan Country Programme. The Danish-Pakistani cooperation is now focused on enhancing trade and economic relations, as well as nurturing the people-to-people relations to the benefit of both countries. Danish knowledge and technology, built over decades of dedicated engagement, can deliver much needed solutions for Pakistan as a lower middle income country. DSIF intends to further support the transition towards trade and economic cooperation by facilitating a loan through a private bank and to introduce Danish companies and sustainable technical solutions for waste water management.


Pakistan falls into the prioritized countries for development assistance as a country in transition and growth. The Danish Development and Humanitarian Strategy – World 2030 recognises the importance of the 17 Sustainable Development Goals and emphasises inclusive, sustainable growth and development and prioritize sustainable solutions for improving energy, water, agriculture and food.

The development impact of the DSIF project supports the Danish priorities of providing sustainable solutions for energy and water and improve quality of agricultural production in the area of Channel No. 4.

The assessment of the human rights situation in Pakistan raises concerns in general. Of direct relevance to the project are gaps in legislation and law enforcements in the areas of labour conditions, child labour, safety conditions, discrimination and rights related for compensation of land. DSIF will make it a precondition in contracts with contractor and agreements with government authorities and WASA that IFC Performance Standard 2 and 5 (Labour and Working Conditions/ rights of compensation of land)) are adhered to. Compliance will be monitored by the DSIF/DSIF monitoring consultant, who will visit the project site on a regular basis.

DSIF is applicable in developing countries with a GNI per capita below the World Bank limit of lower middle-income countries of USD 3.955 (for current 2018 fiscal year) and with a Danish representation. Pakistan had a GNI per capita of USD 1.580 in 2017 and is therefore eligible for Danida Business Financing.

Furthermore, financial calculations made within the framework of the project feasibility study has concluded that the project is financially non-viable on commercial terms and thus fulfils the conditions for tied financing according to OECD guidelines.

JC Rating - Satisfactory 

JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account

Coherence with national development policies and strategies was examined at feasibility and appraisal stages. Pakistan has a National Sanitation Policy dating from September 2006. Regarding Urban Sanitation, the policy states "Wherever sewage has been planned to dispose in storm water drains, such drains will be converted into box trunks, or trunk sewers will be laid in them or on either side of them to terminate in treatment facilities. The treated effluent may then be discharged into natural water bodies, used for agricultural purposes or converted in lakes and ponds, as part of recreational areas. The government will develop necessary National Effluent Quality Standards (NEQS) for effluent to be used for these different purposes." The Sanitation Policy also states: "By-laws on sanitation related issues will be developed by the provincial governments and implemented by the Tehsil Municipal Administrations (now transformed into Water and Sanitation Agencies – WASAs) and development authorities for developing sanitation systems including sewage and wastewater treatment facilities for housing and other development schemes in private sector. The proportionate costs of appropriate sanitation system developed will be charged from the developers by the local governments".

Punjab (the Province in which Faisalabad is located) is the most populous province of Pakistan with approximately 55.6% of the total population of the country. With present growth rate of the population, Punjab is expected to have population of 130 million in 2030 and about 181 million in 2050. Rapid urbanisation and fast-growing population will continue to increase demands for sector and sub-sector services, as the current share of urban population is 31.3%.

The Government of Punjab has state policies for improvement of WATSAN coverage with objectives that include 'By 2025 develop mechanisms for reuse, recycling and recharge of wastewater for other municipal and productive uses in major cities and towns. All municipal discharges must comply with National Environmental Quality Standards (NEQS)

The Government of Punjab has steadily been increasing its investments in water supply and sanitation despite major emergencies and disasters. The investment trends show an increase from PKR 8,9 billion in 2009-10 to PKR 36 billion in 2015-16 and PKRs 53 billion in 2017-18. Of the total allocation of 53 billion in 2017-18, the Government of Punjab has set aside PKR 24 billion for clean water in 2017-18 as part of special projects and PKR 15 billion for sanitation and solid waste management. WASA's annual budget proposal already now includes cost for 16 future additional staff planned for the project management unit and 70 staff for future O&M. One of the Provincial Government's objectives is "By 2025, develop mechanisms for reuse, recycle and recharge of wastewater for other municipal and productive uses in all major cities and towns. All municipal discharges comply with National Environment Quality Standards (NEQS)".

Currently <10% of Faisalabad city wastewater has some level of treatment and discharge of untreated wastewater in the city leads to environmental detriment and constitutes a serious health hazard for the population.

Each province in Pakistan has its Water and Sanitation Agency – WASA, responsible for providing drinking water as well as sewerage connection to the population. However, though a sewerage network exists in all major cities, the wastewater is NOT treated, but led directly out into a river.


A study by the Pakistan Council of Research in Water Resources from 2006 – "Impact Assessment of sewerage and industrial effluents on water resources, soil, crops and human health in Faisalabad" – documents very well the situation and gives good recommendations including on future strategies.

However, as no action has been taken over the last 10 years to improve the sewerage situation in Faisalabad – or anywhere else in Pakistan – it is obvious that there is an urgent need for implementation of wastewater treatment facilities in Faisalabad.

Stakeholder views were considered:

All stakeholders with whom the AT has interacted both at district and provincial level have demonstrated a good knowledge of the project and a high level of commitment to ensuring its smooth implementation.

WASA has consulted all major stakeholders in the district and agreement with these has been obtained when necessary. The AT notes in particular that an agreement has been entered between WASA and the Department of Irrigation¹²⁷ thus ensuring that raw water, which will be sourced from upstream of the Gogera irrigation branch canal to the future AFD funded Water Supply System will be substituted by more than the double amount from the treated effluent from the Danish funded wastewater treatment plant, which will be returned downstream to the Gogera irrigation canal. Thus the flow rate in the canal will be maintained for irrigation purposes.

JC Rating - Satisfactory 


JC 1.3 Added value of Project Preparation Facility (PPF)

An observation of the Programme Committee (14 December 2017) was that the Environmental Impact Assessment to be carried out by the Pakistani authorities would not be available to inform the feasibility study. The Programme Committee recommended that the scope of the feasibility study be substantially widened to cover analysis of the project's social and environmental impact, in order for this work to feed into the initial design of the project and choice of technology.

The Feasibility Study for Faisalabad Wastewater Treatment Plant was financed by the DSIF Project Development Facility (DKK 6,5 million) and was carried out by SWECO Danmark A/S in collaboration with Halcrow Pakistan (Final version. October 2018). The feasibility study and project document were appraised by the consultant company RDC in January and February 2019.

The feasibility study identifies possible negative environmental impacts during pre-construction, construction and operation phase and provides guidance for mitigating negative impacts. The study proposed concrete mitigating measures for the preparation, construction and operation phase of the plant. The study includes a socio-economic baseline, a chapter on human rights, and an environmental assessment and has informed the EIA by the Pakistani authorities. HRBA issues were identified and are reflected in the project document and recommendations have been incorporated into the overall project design.

Implementation of the DBF project has prospects of facilitating future investments with development impact in support of the sector Master Plan (2019 - financed by JICA) and the development plan of Faisalabad Development Authority being prepared, which together constitute a coherent and realistic plan for managing waste water and water supply for the whole city. In order to support this aspiration DBF feasibility study covered the whole city with solutions to waste water treatment plants for Faisalabad and hence the feasibility study may be used to mobilise additional financial resources for future works (SDG 17).

JC Rating – Satisfactory 

JC 1.4 Complementarity with development partners operations and strategies


¹²⁷ Letter from the Irrigation Department dated June 19, 2017

DSIF had a meeting with all donors in the Water and Sanitation Sector in Pakistan, and it is a general perception among donors in the Water and Sanitation Sector in Pakistan that WASA Faisalabad is a very professional and serious collaboration partner. This has been confirmed by the preliminary discussions with WASA Faisalabad in the preparations of the project during the last year.

Several big donors are assisting the sector, e.g. JICA (Japan) with a Master Plan for wastewater in Faisalabad and AFD (France) with an Extension of Water Resources Project for Faisalabad WASA, as well as an institutional reform of all WASAs in Pakistan. AFD also intends to support WASA Faisalabad with use of the treated water (from the planned Danish supported project) for irrigation to the farmers.

JICA has funded and prepared a Master Plan for Water Supply, Sewerage and Drainage, based on which an overall development plan of the Faisalabad area is currently being prepared by the authorities. The Water and Sanitation Agency (WASA) had asked for solutions to cover the entire city - four wastewater treatment plants in total - but has given the two treatment plants of the eastern zone priority. Based on technical, institutional, financial and economic analyses, the Feasibility Study has described a priority investment project, which includes both treatments plants and suggest that they are placed at the same site. The DSIF project is a 200.000 m³ treatment plant covering the Channel no. 4 sub-catchment. The second project will have the capacity of app 300.000 m³ covering the Santiana Drain. Several donors have expressed interest in financing the latter, including the French Development Agency, but firm commitment has yet to be established. The DSIFDSIF project will triple the existing capacity of treating waste water in Faisalabad and being able to service app. 15 pct. of the city.

Other donors are active in the water and sewerage sector in Faisalabad and complements the current project. The World Bank supports an on-going project related to metering of drinking water connections in Faisalabad. AFD (French Development Agency) has funded a water treatment plant for drinking water and are planning an additional surface water treatment plant. The DSIF project is closely interlinked with the latter, as WASA cannot build the surface water treatment plan without been able to guarantee enough intake of water from the Gogera Canal, which will be delivered by the DSIF project. The four donors active in the water sector in Faisalabad (JICA, WB, AFD and Danida) have a common interest and approach vis a vis the Punjab government on the need for gradually increasing the water tariffs.

JC Rating – Satisfactory 

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

The project will have substantial developmental impact, in particular by contribution to improved standards of sanitation in Faisalabad. The project will treat wastewater from 765.000 people and industrial and commercial users and increasing recycling and safe reuse of water. In addition, the project will provide treated wastewater as raw water for the future French funded (AFD) surface water treatment plant. (SDG 6). The project will also contribute to production of renewable energy from sludge to run the plant (SDG 7), as well as the production of effluent and sludge suitable for agricultural reuse (SDG 12).

Implementation of the DSIF project have good prospects of boosting future investments with development impact in support of the sector Master Plan from 2019 (financed by JICA) and the development plan of Faisalabad Development Authority being prepared, which constitute a coherent and realistic plan for managing waste water and water supply for the whole city. In order to support this aspiration DSIF feasibility study covered the whole city with solutions to waste water treatment plants for Faisalabad and hence the feasibility study may be used to mobilise additional financial resources for future works (SDG 17). By financing this first and crucial project the DSIF will make it possible for AFD to finance their second water treatment plant for drinking water, as the DSIF financed WWTP will discharge treated water into the Gogera canal for both irrigation purposes and for raw water intake.

The project is assessed as contributing to achievement of SDGs:

SDG 6: Target 6.3: Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, having the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

SDG 6: Target 6.7: Expand international cooperation and capacity building support to developing countries in water and sanitation related activities including wastewater treatment.

Indicators: To be defined.

SDG 17: Target 17.3: Mobilize additional financial resources for developing countries from multiple sources.

Indicator: amount mobilised (target DKK 400-500 million)

Other potential results the relevance of which will be assessed include SDGB, direct jobs created during construction and during operation; SDG 9: On resilient infrastructure; SDG 12: on sustainable consumption and production and SDG 13: on climate.

Status and progress of Pakistan in relation to SDGs:


Pakistan's performance against the MDGs has been lower than the South Asia Region average for most of the social indicators. Such slow progress is inadequate to address the large burden caused by a growing population and needs to be accelerated.

SDGs of particular relevance in the context of the project:

- SDG 3 (health): Although Pakistan has made significant progress in improving key health indicators, under-five mortality rate continues to be significantly higher compared to similar income group countries and Punjab seems to be the main driver of this underperformance. Furthermore, Punjab has a high prevalence of children under-5 with diarrhoea and viral hepatitis – diseases related to contamination of water, inadequate disposal

of wastewater and solid waste. The wastewater treatment plant (WWTP) project will in its first phase ensure that collected wastewater in the Eastern catchment of Faisalabad is treated according to national and international standards and thus provide a contribution to reducing water-borne diseases.

- SDG 6 (water & sanitation): Despite the substantial progress achieved in improving access to clean water, sanitation and hygiene, 22 million people still do not have access to clean water and 79 million do not have access to proper sanitation. Furthermore, nearly 19.500 children below the age of 5 die each year from diarrhoea. Ten major cities of Pakistan produce more than 60 per cent of the urban wastewater, and out of which less than eight per cent is treated, according to the World Bank (Country Water Resources Assistance Strategy paper). The contaminated water is being disposed of into rivers, irrigation canals, vegetable farms and drains. The WWTP project will ensure that wastewater is treated to national standards and minimise health hazards related to the use of untreated wastewater for irrigation.
- SDG 7 (affordable clean energy): Nearly all Pakistanis have access to electricity (99%), but households and industries are severely challenged by regular power cuts. 31% of the total electricity consumption stems from renewable energy sources, primarily wind (World Bank 2016). The WWTP in Faisalabad will utilise biogas to produce electricity to run the plant.
- SDG 12 (sustainable consumption & production patterns): With the aim to achieve sustainable socio-economic development by eliminating inefficiencies and over exploitation of resource base to protect environmental degradation, a National Action Plan on Sustainable Consumption and Production (NAP-SCP) has been adopted in 2017. It attaches top priority to mainstreaming sustainable consumption and production in the sector policies of the Government. The WWTP-project will contribute to this SDG through the production of effluent suitable for agricultural reuse.
- SDG 17 (partnerships): The Feasibility Study funded by DSIF addresses wastewater treatment for the entire city of Faisalabad although DSIF funding will only suffice to address wastewater treatment in the Eastern zone of Faisalabad. The client (WASA Faisalabad) may use the Feasibility Study to attract additional funding from Government and/or international funding institutions for the Western catchment as well as investments in future stages if the treatment works.

JC Rating – Satisfactory 

EQ 1 Overall Rating – Satisfactory

DSIF financing is highly relevant for design and preparation of the project (through PPF) and for the eventual construction of the waste water treatment plant itself. Also the DSIF FS covered the needs of wastewater treatment for the whole city and is this relevant to other potential support projects. The project responds to a clear national need for such waste water treatment which arguably should have been addressed nationally years ago on the grounds of continuing environmental and public health detriment resulting from discharging untreated water into irrigation canals. In this respect Danish support is fully complementary to other development partners' activities in the sector (e.g. JICA, AFD) although the timing of Danish support appears to lie awkwardly with the phasing out of Danish development assistance to Pakistan at the end of 2016.

EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p>At Appraisal stage it was assessed that the project is compliant with DSIF strategic guidelines despite Danish development assistance to Pakistan being phased out by the end of 2016.</p> <p>In 2017 the Government of Pakistan submitted a request to the Royal Danish Embassy in Islamabad (from the provincial Government of Punjab) to consider the financing of a feasibility study for construction of Wastewater Treatment Plants in Faisalabad. After consultations with DSIF in Copenhagen, the Danish Embassy informed EAD that Denmark would proceed further on this matter as it was considered that the project fits well with DSIF strategic guidelines including:</p> <ul style="list-style-type: none"> • Waste water treatment is a prioritised sector where Denmark has competitive solutions to offer to promote the achievement of the SDGs • Pakistan is a partner country to Denmark with important economic and political relations <p>In November 2017, an MOU was signed between the Government of Punjab through the Water & Sanitation Agency (WASA), Faisalabad and the Danish Embassy in Islamabad on collaboration between the Pakistani and Danish governments on a major wastewater treatment project in Faisalabad.</p> <p>See also JC 1.1 above.</p> <p>JC Rating – Satisfactory </p>	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p>Danish – Pakistani diplomatic relations date back to 1969, when Denmark opened its Embassy in Islamabad. Over the years, Danica has supported Pakistan in the areas of Education, Human Rights, Gender Equality, Democratization, Peace and Stability – often with NGOs or UN agencies as implementing partners. The latest support programme (DKK 229 million) was provided through a 2013-2016 programme to peace building, livelihoods, education and to civil society organisations with a clear rights mandate in the areas of democratisation, human rights and gender equality. Danish development assistance to Pakistan was phased out</p>	


by the end of 2016, but Danish Refugee Council, Danish Red Cross and International Media Support continue their activities in the country under framework agreements with the Ministry of Foreign Affairs in Denmark. Danida, like many other international donors have been implementing water and sanitation facilities in developing countries over the last 40 years.

In 2015, Denmark decided to end the bilateral development assistance to Pakistan by phasing out the Pakistan Country Programme. The Danish-Pakistani cooperation is now focused on enhancing trade and economic relations, as well as nurturing the people to people relations to the benefit of both countries. Danish knowledge and technology, built over decades of dedicated engagement, can deliver solutions for Pakistan as a lower middle income country. DSIF proposes to further support the transition towards trade and economic cooperation by facilitating a loan through a private bank and to introduce Danish companies and sustainable technical solutions for waste water management.

The development impact of the DSIF project supports the Danish priorities of providing sustainable solutions for energy and water and improve quality of agricultural production in the area of Channel No. 4.

The project is in line with Danish development strategy "World 2030 (Denmark's strategy for development cooperation and humanitarian action – NFA/Danida Jan 2017) in which it is stated that *"While growth can lift millions of people out of poverty, it may often have less-desirable effects as well. Such effects could e.g. be unsustainable consumption patterns that lead to pollution and contamination of air, soil, water as well as increased waste problems, thus posing a threat to health and environment"*. The strategy also emphasizes climate change and sustainable energy as priority areas and a focus on areas in which Denmark has strong competences, such as resource effective and sustainable energy and water solutions.

With the few WWTP currently in operation in Pakistan, the Faisalabad WWTP may become a national centre of expertise and thus a window to the expertise than can be provided by Danish contractors and consultants.

JC Rating – Satisfactory 

JC 2.3 Danish business links with beneficiary countries

Pakistani-Danish trade relations have grown steadily over the last years, At present, over 40 Danish companies are active in Pakistan through local distributors. They operate in sectors such as Food & Agriculture, Energy & Water, Life Sciences (pharmaceuticals, hospital supplies & equipment), Chemicals, Software Development and Textiles, Danish companies present in Pakistan are: Maersk, Damco, Novo Nordisk, Lundbeck, Novozymes, Vestas, FLSmith, Grundfos and Danfoss. Haldor Topsoe has a long history of doing business in Pakistan, mainly in the fertilizer business where IFU had also made investments.

The Trade Department of the embassy functions as secretariat of the Pakistani-Danish Business Club, which has 25 members. Faisalabad is the centre for the textile industry in Pakistan. Some of the textile manufacturers are members of the Pakistani-Danish Business Club and export textiles to Denmark. During a visit to Faisalabad, the Ambassador met with leading business people and Pakistan Hosiery Manufacturers & Exporters Association. They expressed a keen interest to increase trade with Denmark and saw the proposed Wastewater Treatment Project as an important step to boost commercial cooperation. A successfully implemented project could strengthen the likelihood that Danish solutions are chosen in other prioritised wastewater treatment projects in Pakistan, including those financed by others. The project envisages the involvement of Danish firms in the following roles:

Technical Assistance



- To support the investment and assist the capacity building Technical Assistance (TA) will be engaged in a number of tasks (financed by DSIF as a grant unless otherwise stated):
- A procurement consultant will support WASA in the procurement process and provide support to DSIF to issue "no objection" to the evaluation of proposals.
- A tender consultant will support WASA during the tender and negotiation process.
- A construction and supervision consultant will be financed as part of the loan.
- A monitoring consultant for the entire duration of the project, including 5 years of O&M. On behalf of DSIF the consultant will monitor project implementation by regularly visiting the site and monitor progress and adherence of contractors/subcontractors to human rights issues
- The Appraisal report suggest that TA 2 and 3 is carried out by the same company.




Works Contract


- Participation in the tender process will be open to Danish companies, or Danish-led joint ventures.
- The DSIF rules for works contracting requires the award of contract based on a conforming offer demonstrating lowest life-cycle cost⁶.
- Tenderers will be asked to guarantee performance characteristics of key items of equipment (Functional Guarantees). These performance characteristics will be used to determine the annual operating costs.
- The project will be designed so that it adheres to IFC Performance Standards and UN Guiding Principles and Human Rights.
- Upon completion of the works, the equipment shall be subjected to performance tests (Tests after Completion) to compare the actual operating performance with the guaranteed value. If the guaranteed performance is not met, the Contractor will be asked to modify the works or will be charged "damages" to contribute to the higher operating costs incurred by the End Recipient. Such damages shall be paid to the End Recipient.

Project Management Arrangement

- For the project preparation and implementation, WASA will establish a temporary Project Management Unit (PMU) staffed by WASA regular staff and/or recruited staff. The PMU will be operational until the completion

<p>of the 5-year O&M support period. The unit will include staff that will be responsible for operating the WWTP after commissioning. The PMU will be assisted by TA for the tender, contract management and supervision phases.</p> <ul style="list-style-type: none"> The Danish contractor will be responsible for the detailed design, construction and operation of the WWTP for a 5-year period. During construction and 5 years of operation, it will be the contractor's responsibility to make sure that the contractor and the subcontractors comply with the IFC Performance Standards on Environmental and Social Sustainability (especially on Performance Standard 1 "Assessment and Management of Environmental and Social Risks and Impacts", Performance Standard 2: "Labour and Working Conditions" and Performance Standard 4 "Community Health, Safety and Security"), and the UN Guiding Principles on Business and Human Rights. This will be clearly stated in the tender documents. <p>Danish firms (contractors, consultants and suppliers) have a solid knowledge and experience gained internationally in the water and sanitation sector and are able to provide state-of-art technologies in this sector including supply, installation and technical assistance to operation of pumps and treatment technologies together with associated control and monitoring equipment. Further, the sanitation/sewerage situation in the cities of Pakistan is generally bad and if the project is successfully implemented, new opportunities might emerge for Danish companies for similar projects in other cities and for the second phase of the wastewater treatment project in Faisalabad.</p> <p>JC Rating – Satisfactory </p>
<p>EQ 2 Overall Rating – Partly Satisfactory </p> <p>The project is in line with Danida's 'World 2030' strategy especially as regards environmental sustainability. Danish businesses have become increasingly engaged in Pakistan over the past decade or so and, given the manifest need for extensive national development of waste water treatment facilities, there is potential for continuing and expanding Danish involvement in this sector in which a number of Danish firms have proven capability.</p>

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>See also JC 2.3 above and JC 8.1 and 8.2 below.</p> <p>DSIF is expected to provided funding for the establishment of a wastewater treatment plant with a grant element of 35%, which will mobilize the other 65% of the necessary financing from the private sector (a bank with a Danish subsidiary) within a suggested maximum cost of a full project of DKK 750 million. DSIF support to Faisalabad WASA, being tied to Danish solutions will introduce advanced and sustainable Danish water treatment technologies to Pakistan and possibly provide for more engagement.</p> <p>DSIF's financial additionality is principally in the form of concessional funding and grants, which were important given the poor financial condition of DWASA and the negative financial rate of return that was demonstrated by the financial analysis that was included in the feasibility study. The primary reason for the lack of financial viability is the lower tariffs that are too low to cover FWASA's operating costs. Since the project is not financially viable commercial finance was not possible.</p> <p>JC Rating – Satisfactory </p>	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
<p>DSIF has provided support to WASA for a feasibility study that describes and analyses the current situation in the two zones and propose appropriate technological and institutional solutions for construction and operation of one or more treatment plants to remove all hazardous elements from the wastewater of Faisalabad being led into Maduana Drain.</p> <p>With the DSIF focus on Life Cycle Cost, the feasibility study will assist and capacitate WASA Faisalabad to design and implement a cutting-edge sustainable technological solution, including reaching their aim of having 90% of energy recovery from the treatment plant as well as re-use possibilities of the treated wastewater.</p> <p>At appraisal stage it was concluded that the project is financially non-viable on commercial terms and thus, according to OECD guidelines, it fulfils the conditions for DSIF financial support.</p> <p>JC Rating - Satisfactory </p>	
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	
<p>No commercial or development bank funding mobilised</p> <p>JC Rating – N/A</p>	
<p>EQ 5 Overall Rating – Satisfactory </p> <p>Given that at appraisal the project was found to be financially non-viable on commercial terms but economically viable, it can be concluded that DSIF financing will enable the project, which has potential social and environmental benefits, to go ahead. However, economic viability depends upon proposed tariff reforms – see below also. It is not expected at this stage that financing sources other than DSIF will be involved.</p>	

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
Implementation has not yet started JC Rating – N/A	
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
<p>The project is expected to have a substantial developmental impact, in particular by contribution to improved standards of sanitation in Faisalabad in that wastewater from 765,000 people and industrial and commercial users will be treated with increasing recycling and safe reuse of water. In addition, the project will provide treated wastewater as raw water for the future French funded (AFD) surface water treatment plant. The project will also contribute to production of renewable energy from sludge to run the plant, as well as the production of effluent and sludge suitable for agricultural reuse.</p> <p>Implementation of the DSIF project has good prospects of boosting future investments with development impact in support of the sector Master Plan from 2019 (financed by JICA) and the development plan of Faisalabad Development Authority being prepared, which constitute a coherent and realistic plan for managing waste water and water supply for the whole city. In order to support this aspiration DSIF feasibility study covered the whole city with solutions of waste water treatment plants for Faisalabad and hence the feasibility study may be used to mobilise additional financial resources for future works. By financing this first and crucial project DSIF will make it possible for AFD to finance their second water treatment plant for drinking water, as the DSIF financed WWTP will discharge treated water into the Gogera canal for both irrigation purposes and for raw water intake.</p> <p>The project as assessed should contribute to achievement of SDGs which are of particular relevance in the context of the project:</p> <ul style="list-style-type: none"> • SDG 3 (health): The wastewater treatment plant (WWTP) project will in its first phase ensure that collected wastewater in the Eastern catchment of Faisalabad is treated according to national and international standards and thus provide a contribution to reducing water-borne diseases. • SDG 6 (water & sanitation): The WWTP project will ensure that wastewater is treated to national standards and minimise health hazards related to the use of untreated wastewater for irrigation. • SDG 7 (affordable clean energy): The WWTP in Faisalabad will utilise biogas to produce electricity to run the plant. • SDG 12 (sustainable consumption & production patterns): The WWTP-project will contribute to this SDG through the production of effluent suitable for agricultural reuse. • SDG 17 (partnerships): The client (WASA Faisalabad) may use the Feasibility Study to attract additional funding from Government and/or international funding institutions for the Western catchment as well as investments in future stages if the treatment works <p>JC Rating – Satisfactory </p>	
JC 6.3 Environmental, social and governance (ESG) risk management	
<p>An environmental assessment has been carried out in the framework of the FS. This assessment concludes there are not any major adverse environmental and social impacts of the project neither in the construction phase nor in the operational phase of the facility. However, a full-scale EIA that will feed into the detailed design phase of the project is mandatory according to national legislation. It is to be noted that it would not have been possible to carry out this assessment prior to the FS phase, as a preliminary design of the future project is a prerequisite for carrying out an EIA as such.</p> <p>The national process for the approval of the EIA includes an initial approval by the district Environmental Protection Agency (site inspection report) It was expected that approval at district level would be given shortly after the submittal of the draft EIA as the Environment Protection Agency (EPA) in Faisalabad has been closely consulted during the feasibility study phase. According to EPA's guidelines, the final approval by provincial EPA might take between 90 to 120 days.</p> <ul style="list-style-type: none"> • The feasibility study identifies possible negative environmental impacts during pre-construction/design, construction and operation phases and provide guidance for how to limit and mitigate the impact. Mitigation measures are proposed under the following headings: • <i>Pre-construction/design phase:</i> Environmentally responsive design considerations, selection of treatment options, re-use of treated waters, solid waste, seismic hazard, public utilities, sludge management, land acquisition and resettlement, traffic management and flooding • <i>Construction phase:</i> Topography and landscape, soils, construction camos, water quality, air quality, noise, municipal and construction waste/wastewater, resource and bio-diversity conservation, health and safety, emergency management, traffic management, nuisance/disturbance to social sensitive areas, accessibility, social/cultural conflicts,. • <i>Operational phase:</i> Soils, air quality, solid waste, groundwater, surface water, sludge disposal , • The overall assessment is, that the identified negative effects (noise, dust, waste) can be mitigated in the detailed design of the plant and through proper management of e.g. waste management during construction. • The treated effluent will meet international standards (NEQS, WHO and EU discharge standards), and contribute positively to the environment in the Faisalabad area in general terms and more specifically the quality of the scarce ground- and surface water resources in the Channel 4 sub-catchment. The project will 	

contribute to enhancing the health of the population in Faisalabad as use of highly polluted wastewater for irrigation purposes will cease.

- The project will benefit the population in East Faisalabad and thus will also have a poverty reduction perspective as such and it is likely that the household health expenses, which constitute a substantial part of total household expenses, will diminish. It is further expected that WASA will maintain a differentiated tariff structure favouring the small household consumers.

WASA has made arrangements for a full Environmental Impact Assessment (EIA) of the project and associated inlet and effluent pumping activities and this draft EIA (National Engineering Services Pakistan PVT Ltd March 2018) has been scrutinised. The draft EIA has been submitted to the Environmental Protection Agency early March 2019, as first step in the approval process. The final approval, after public hearing, is expected to be issued by Q3 2019, in due time to provide input to detailed design of the wastewater treatment plant, which will only be initiated by the Contractor once down payment has been received. In the Buyer-End User Declaration DSIF will request a precondition inserted to the effect that the Punjab Environmental Protection Agency has approved the EIA before any disbursement can be made from the loan. This EIA appears to be comprehensive the main heads considered including: Policy, legal and administrative frameworks, project description, environmental baseline, public consultation and anticipated environmental impacts and mitigation measures, HRBA principles have been considered at appraisal stage.

The FS has carried out a thorough analysis of issues related to human rights within the project. The outcome of this analysis should naturally be taken into account in the Conditions of Contract when contracts are entered with contractors and suppliers. One example is the use of child labour e.g. in brick kilns. Pakistan has a list of approved contractors, which meet the requirements for non-use of child labour. Only contractors from this list should be eligible for providing goods and works for the project. It has to be noted that it is the responsibility of the Danish contractor to respect this condition, for which reason, it must be included in the Exporter's Declaration to be signed by the Contractor and addressed to DSIF.

During the construction phase, one of the tasks of the monitoring expert to be appointed by DSIF should be to control on a random basis that contractors and suppliers are complying with human rights principles.

There is little reference to 'gender' in project documentation scrutinised by the evaluation and no reference to 'gender mainstreaming'.

Human Right Standards (international, regional and national legislation)

Pakistan has ratified and continues to implement seven core international human rights treaties and two optional protocols, including:

- International Covenant on Civil and Political Rights (ICCPR), ratified in 2010
- International Covenant on Economic, Social and Cultural rights (ICESCR) ratified in 2008.
- Convention on the Elimination of all Forms of Discrimination against Women (CEDAW) ratified in 1996.
- Convention on the rights of the Child (CRC), ratified in 1990.

Until 2015, Human rights were under the responsibility of the Ministry of Law and Justice. In 2015, Human rights were separated, and a Ministry of Human rights was established. It has a wide mandate including mainstreaming of human rights in the country. One of the four regional offices is placed in Lahore. A National Commission on Human rights established in 2012 takes actions against cases of all human rights violation in the country. All provinces have separate Human rights Departments which are mandated to coordinate with public and private sector institutions as well as Civil Society Organizations (CSOs) to promote human rights, to gather information, prepare fact finding reports on complaints and allegations on human rights violations and conduct inspections. District Human Rights Committees are established to monitor the human rights situation across the country (Human Rights Council, 2017). Offices of Wafaqi Mohtasib (Ombudsman) is functioning since 1983 and has a Regional Office in Punjab

As to civil society organizations, both national and international NGOs face constraints. Late 2018, 18 International NGOs (INGOs) have been denied renewal of their licence to operate in Pakistan, most of which are from Europe, Canada and Australia, including the Danish Refugee Council. EU member states together with other like-minded countries are in constant dialogue with the Pakistani government on this issue.

Although the Government of Pakistan has ratified the main human rights and ILO Conventions and developed national legislation, major gaps exist in the practices. In 2017, the UN Human rights Committee reviewed the implementation of human rights treaties in Pakistan, identifying issues related to a number of human rights aspects, including i) Non-discrimination; ii) Prevalence of violence against women; and iii) Child labour. The review of policies and practices of relevance to the Feasibility Study points to additional gaps, including:

- General lack of law enforcement especially related to labour conditions.
- Child labour forced and bonded labour in construction materials industries.
- General poor health and safety practices and lack of enforcement.
- Gaps in land acquisition and resettlement practices.
- Gaps in the implementation of legislation related to non-discrimination. Lack of equal opportunities, including low participation and inclusion of women, ethnic minorities and vulnerable groups in decision-making, and low economic participation of women.

In order to cope with the above mentioned gaps, the DSIF financed programme will include the following:

- Ensure that adherence to IFC PS2 (labour and working conditions) is included as a precondition for contracting contractor and construction companies. Sourcing of construction materials from officially licenced and approved quarries and brick kilns industries free of child labour and forced labour.

- Develop construction management plan including measures to ensure health and safety of communities during construction.
- Ensure that women and men within all population groups are consulted prior to construction, during construction and operation of the WWTP, with particular focus on vulnerable groups, the peri-urban poor and farmers.
- Give specific attention to the working conditions of the minorities working as sewer workers, including health and safety and changing their employment status from daily labourers to contracted staff, which will improve their working conditions.

Universal Periodic Review

The major recommendations from the last Universal Periodic review on abolition of death penalty, and protection of religious minorities, which were just noted by Pakistan, but not accepted, are not directly relevant for the WWTP project in Faisalabad.

Key rights holders in the programme are: i) Population of Faisalabad; ii) Impacted community members including farmers using the waste water for irrigation and the peri-urban poor; iii) WASA workers and their families, including daily labour; iv) Contractor employees and their families; v) Supply chain workers and their families.

Key duty bearers in the programme are: i) WASA Faisalabad; ii) Danida Business Finance; iii) Suppliers and Contractors; iv) Faisalabad Authorities including Faisalabad City Administration, Faisalabad Development Authority, Faisalabad District Council, Faisalabad Irrigation Department, road Authority, Faisalabad District Health authority, Faisalabad District Human rights Commission, Land Commissioner; v) Punjab Provincial Government Organisations including Planning and Development Department, Health Department, Environmental Protection Department, Labour and Human Resource Department, Agriculture Department, Food Department/Food Authority, Land Revenue Department, Human rights and Minority Affairs Department, Regional Directorate of Human Rights, Women Development Department, Ombudsman; vi) Federal Government Organisations including Ministry of Water and Power, Ministry of Overseas Pakistanis and Human Resource Development, Ministry of Human Rights, National Commission for Human Rights, Environmental Protection Agency.

Human Rights Principles (PANT)

Participation

- Women and men within all population groups will be consulted during construction and operation of the WWTP, with particular focus on vulnerable groups, the peri-urban poor and farmers.

Accountability

- WASA-Faisalabad is accountable vis-à-vis the Government of Punjab with all its relevant departments.
- DSIF will finance a Monitoring Consultant throughout the construction and operation & maintenance period, who will also check the Contractor's respect of various Rights Holder issues.


Non-discrimination

- In general, WASA complies with national legislation and is in compliance with most of IFC requirements on non-discrimination. However, WASA pays little attention to issues of equal opportunity and does not fulfil their obligation to meet national quotas for women in employment. However, with foreign donors now working with WASA-Faisalabad, a slight change of attitude is perceived within management.

Transparency

- Comprehensive consultation and awareness raising in Urdu among farmers using the polluted water from Channel No. 4 for irrigation to shift to irrigation water provided by Irrigation Department.

The quality of assessment of environmental impacts undertaken to date is satisfactory albeit the detailed EIA has yet to be finally approved as a full-scale EIA that will feed into the detailed design phase of the project is mandatory according to national legislation. Negative environmental impacts during pre-construction/design, construction and operation phases have been identified together with proposed mitigation activities. The overall assessment is that the identified negative effects can be mitigated in the detailed design of the plant and through proper management whilst the treated effluent will meet international standards and contribute positively to the environment in the Faisalabad area and more specifically the quality of the scarce ground- and surface water resources in the Channel 4 sub-catchment. The project will contribute to enhancing the health of the population in Faisalabad as use of highly polluted wastewater for irrigation purposes will cease. HRBA principles have been considered but there is little reference to 'gender' in project documentation scrutinised by the evaluation and no reference to 'gender mainstreaming'. In order to address such issues the DSIF financed programme will: ensure that adherence to IFC PS2 (labour and working conditions) is included as a precondition for contracting contractor and construction companies; develop a construction management plan including measures to ensure health and safety of communities during construction; ensure that women and men within all population groups are consulted prior to construction, during construction and operation of the WWTP; and, give specific attention to the working conditions of the minorities working as sewer workers,


JC Rating – Satisfactory 

JC 6.4 Contribution to climate change mitigation, green and inclusive development

It is expected that the WWTP will have a highly positive contribution to climate change mitigation, green and inclusive development by:

- reducing the level of pollution from a steadily growing number of industries and households in the city area itself


- preventing the use of heavily polluted wastewater for irrigation, it will also contribute to a cleaner and healthier environment in areas outside the city;
- contributing to development of a low-carbon and climate resilient economy through recovery of energy from the wastewater (produced biogas will gradually be able to cover an increasing part of the electricity needed for running the WWTP and thus reduce dependency on non-renewable energy sources).

JC Rating - Satisfactory 

JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

There is no explicit reference to Helsinki Principles in the project documentation but there is reference to low-carbon and climate-resilient growth.

The project is expected to contribute to the development of a low-carbon and climate resilient economy through recovery of energy from the wastewater (whilst produced biogas will gradually supply a large part of the electricity needed for running the WWTP and thus reduce dependency on non-renewable energy sources). Also the WWTP will be built to be resilient to flood risks and use of energy efficient equipment and production of electricity on the basis of biogas (SDG 13). Overall the project is in line with the Danish development strategy "World 2030"¹²⁸.

JC Rating - Satisfactory 

EQ 6 Overall Rating – Satisfactory

The project is expected to have substantial developmental impacts, in particular by contribution to improved standards of sanitation in Faisalabad and, in addition, the project will provide treated wastewater as raw water for the future French funded (AFD) surface water treatment plant. The project will also contribute to production of renewable energy from sludge to run the plant, as well as the production of effluent and sludge suitable for agricultural reuse

The quality of assessment of environmental impacts undertaken to date is satisfactory albeit the detailed EIA has yet to be finally approved as a full-scale EIA that will feed into the detailed design phase of the project is mandatory according to national legislation. Negative environmental impacts during pre-construction/design, construction and operation phases have been identified together with proposed mitigation activities.

The project will contribute to enhancing the health of the population in Faisalabad as use of highly polluted wastewater for irrigation purposes will cease. HRBA principles have been considered.

It is expected that the WWTP will have a highly positive contribution to climate change mitigation, green and inclusive development by reducing the level of pollution, preventing the use of heavily polluted wastewater for irrigation and contributing to development of a low-carbon and climate resilient economy through recovery of energy from the wastewater (produced biogas will gradually be able to cover an increasing part of the electricity needed for running the WWTP and thus reduce dependency on non-renewable energy sources).

EQ 7 Commercial /developmental balance

Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?

JC 7.1 Satisfactory development outcomes(using DAC definition of impact)

Although in the Appraisal Report, Faisalabad Wastewater Treatment Plant Project, Pakistan, 2019-2027 Final version – March 11, 2019 only a single outcome appears to have been specified¹²⁹, reference is made to contribution to SDGs of particular relevance in the context of the project¹³⁰:

- SDG 3 (health): Although Pakistan has made significant progress in improving key health indicators, under-five mortality rate continues to be significantly higher compared to similar income group countries and Punjab seems to be the main driver of this underperformance. Furthermore, Punjab has a high prevalence of children under-5 with diarrhoea and viral hepatitis – diseases related to contamination of water, inadequate disposal of wastewater and solid waste. The wastewater treatment plant (WWTP) project will in its first phase ensure that collected wastewater in the Eastern catchment of Faisalabad is treated according to national and international standards and thus provide a contribution to reducing water-borne diseases.
- SDG 6 (water & sanitation): Despite the substantial progress achieved in improving access to clean water, sanitation and hygiene, 22 million people still do not have access to clean water and 79 million do not have access to proper sanitation . Furthermore, nearly 19.500 children below the age of 5 die each year from diarrhoea. Ten major cities of Pakistan produce more than 60 per cent of the urban wastewater, and out of which less than eight per cent is treated, according to the World Bank (Country Water Resources Assistance

¹²⁸ The World 2030. Denmark's strategy for development cooperation and humanitarian action. Ministry of Foreign Affairs/Danida. January 2017 in which it is stated "While growth can lift millions of people out of poverty, it may often have less desirable effects as well. Such effects could e.g. be unsustainable consumption patterns that lead to pollution and contamination of air, soil and water as well as increased waste problems, thus posing a threat to health and environment".

¹²⁹ As set out in the table below

¹³⁰ Source : UPR 26.03 DBF Faisalabad final

Strategy paper). The contaminated water is being disposed of into rivers, irrigation canals, vegetable farms and drains. The WWTP project will ensure that wastewater is treated to national standards and minimise health hazards related to the use of untreated wastewater for irrigation.

- SDG 7 (affordable clean energy): Nearly all Pakistanis have access to electricity (99%), but households and industries are severely challenged by regular power cuts. 31% of the total electricity consumption stems from renewable energy sources, primarily wind (World Bank 2016). The WWTP in Faisalabad will utilise biogas to produce electricity to run the plant.
- SDG 12 (sustainable consumption & production patterns): With the aim to achieve sustainable socio-economic development by eliminating inefficiencies and over exploitation of resource base to protect environmental degradation, a National Action Plan on Sustainable Consumption and Production (NAP-SCP) has been adopted in 2017. It attaches top priority to mainstreaming sustainable consumption and production in the sector policies of the Government. The WWTP-project will contribute to this SDG through the production of effluent suitable for agricultural reuse.
- SDG 17 (partnerships): The Feasibility Study funded by DBF addresses wastewater treatment for the entire city of Faisalabad although DBF funding will only suffice to address wastewater treatment in the Eastern zone of Faisalabad. The client (WASA Faisalabad) may use the Feasibility Study to attract additional funding from Government and/or international funding institutions for the Western catchment as well as investments in future stages if the treatment works.

Otherwise a single outcome is identified in a 'Revised Project Results Framework'¹³¹ i.e.

Outcome	As part of the overall Faisalabad master plan for water supply, sewerage and drainage, domestic and industrial wastewater in the channel n° 4 sub-catchment of the eastern zone of Faisalabad City is adequately treated and the treated effluent is used both as water for irrigation of agricultural land and as raw water to a new drinking water treatment plant in Faisalabad.		
Outcome Indicator	Volume of wastewater treated in project zone		
Baseline	Year	2018	All domestic and industrial wastewater is discharged into nature without any treatment
Target	Year	2025	200.000 m ³ /day treatment capacity
Output 1	A fully operational wastewater treatment plant for the Channel n° 4 sub-catchment		
Output Indicator	The wastewater treatment plant is tendered, constructed and fully operational according to design criteria		
Baseline	Year	2018	No treatment of wastewater in project zone
Target	Year	2020	Tendering and contracting have been completed and work has started
Target	Year	2023	The wastewater treatment plant has started operations
Target	Year	2025	- The wastewater treatment plant operates at a capacity of 200.000 m ³ /day - Regularly updated operational records of O&M of WWTP are available - 85% of WWTP effluent meets the design discharge standards - 70 staff members employed on operation and maintenance of WWTP
Output 2	Channel n°4 has been covered		
Output Indicator	Agricultural food products no longer exposed to health hazards from farmers' use of untreated sewerage water for irrigation purposes		
Baseline	Year	2018	Untreated effluent from Channel n° 4 is currently used for irrigation purposes due to its claimed content of nutrients. This is illegal and negatively affects the quality of agricultural food produce and consequently the health of consumers.
Target	Year	2023	Agricultural food products irrigated by ground water, which contains no health hazards
Output 3	WASA adequately operate and maintain the wastewater treatment plant after a five-year support period		
Output Indicator	- Project Management Unit established and staffed by WASA as planned in 2019 (16 staff members) - PMU staff is transferred back into permanent WASA organization after completion of the construction phase and working closely with DBOT contractor.		

¹³¹ Source : Appraisal Report, Faisalabad Wastewater Treatment Plant Project, Pakistan, 2019-2027 Final version – March 11, 2019

Baseline	Year	2022-2027	The wastewater treatment plant is operated and maintained by the DBOT contractor in close collaboration with WASA, whose staff is trained during the 5 years of O&M.
Target	Year	2027	WASA has fully taken over responsibility for operation and maintenance of the treatment plant, influent pipe, effluent pipe and pump stations from the contractor
Output 4		Treated effluent meeting required standards is channelled to irrigation canal (Gogera Branch) for both agricultural re-use and as contribution to raw water intake for a future drinking water treatment plant	
Output Indicator		Effluent water meets both National Environment Quality Standards and European Standards	
Baseline	Year	2018	The flow of the Gogera Branch cannot accommodate the quantity of raw water intake necessary for the planned new French funded drinking water treatment plant in Faisalabad
Target	Year	2023	The quantity of treated water from the wastewater treatment plant led to Gogera Branch is more than double the amount required for raw water intake to the future French financed Drinking Water Treatment Plant in Faisalabad. Thus, the requirements from the Irrigation Department of Faisalabad are met, i.e. to secure sufficient water both for irrigation of agricultural land and for drinking purposes
Output 5		Biogas produced on the basis of incoming sludge will produce electricity and will contribute to reducing operational expenditure and to reducing emissions of greenhouse gases	
Output Indicator		Percentage of power consumption in treatment plant provided through biogas	
Baseline	Year	2018	-
Target	Year	2024	50% of total power consumption as a conservative assessment
Target	Year	2027	100% of power consumption (26.395 kWh/day produced against 24.000 kWh/day needed for operation of the plant)
<p>There is some doubt about the coverage and completeness of specified outputs in that only 2/5 actually refer to outputs (i.e. outputs 1 & 2) whilst 3/5 are actually outcomes delivered by operation of the infrastructure, as is the single Outcome indicator specified (which refers to the technical performance of the infrastructure). Given that the project is expected to contribute to various SDGs as noted above, it is suggested that outcome indicators could be specified referring to these SDGs (e.g. beneficiary populations, water borne disease transmission, quality testing of discharge waters, biogas production)¹³².</p> <p>JC Rating - N/A as project has not yet been built. Potentially satisfactory</p>			
JC 7.2 Strong ESG performance of DSIF projects			
<p>The draft EIA (March 2018) has been scrutinised by the evaluation and it is clear from the project objectives and from the identified output and outcome targets that a strong ESG performance is expected from the project by comparison with the specified 2018 BL.</p> <p>When operational the WWTP will provide a substantial contribution to reducing the detrimental impact on the environment and on human health caused by the discharge of untreated wastewater directly into the environment. It is thus expected that the currently high incidence of water borne diseases (polio, diarrhoea..) will be reduced but it will not be possible to directly monitor these changes in the health situation due to unavailability of health statistics separately for Faisalabad city.</p> <p>The project will also have a positive effect on the quality of agricultural products and especially on food products as access to extracting polluted wastewater will be prevented along the Channel n° 4 and the quality of irrigation water in the Gogera irrigation canal, to which the WWTP will discharge the treated wastewater will improve.</p> <p>Finally, the WWTP constituted a contribution to ensuring sufficient drinking water in Faisalabad, as part of the treated wastewater will be used as raw water for a future French funded drinking water treatment plant.</p> <p>JC Rating – N/A as project has not yet been built. Potentially satisfactory</p>			
JC 7.3 Satisfactory financial returns and portfolio performance			
<p>Concerns about WASA institutional and financial sustainability were identified in the appraisal report: Institutional Capacity of WASA Faisalabad</p> <p>Although WASA has performed in a satisfactory manner since its establishment, it has limited experience in managing wastewater treatment plants. One wastewater treatment plant is operational in Faisalabad. The current operation activity of the existing facility at the Chokera WWTP in the Western Zone of Faisalabad is very limited, and the facility operates another treatment system than the one to be established in the new plant funded by DSIF. However, the FS concludes that “the current departments of WASA Faisalabad clearly show that</p>			

¹³² Although it is well-noted that public sector statistics regarding health may be limited

competences are available and that a more advanced biological WWTP will be possible to operate and maintain if sufficient resources are assigned”.

The AR concluded that operations and maintenance (O&M) of the future WWTP could be a challenge but noted that WASA in the PC-1 has requested the HUD&PHED (Housing Urban Development and Public Health Engineering Department, Government of Punjab) to provide the funding for the recruitment of 16 staff members for the PMU and of 70 staff members for the O&M of the WWTP. It is, however, required that the WASA establishes a budget line for daily O&M and minor repair works for the new WWTP, which will necessitate continuous tariff increases over the coming years and/or increased GOP subsidies. The Appraisal was informed, that as part of the Punjab Cities Governance Improvement Programme funding request, WASA has suggested a budget to cover operation and maintenance costs at Chokera Plant from the fiscal year starting in July 2019. Furthermore, the AT has been informed that the completed first phase of the French drinking water treatment plant will be run by the PMU that was established for this construction of the plant.

The Appraisal agreed with the measures suggested by the Feasibility Study i.e. establishment of a Project Implementation Unit (PIU) and provision by the WWTP contractor of O&M support for a 5 year period. These measures should ensure that WASA has sufficient experience to run the WWTP when the contractor's assignment comes to an end in 2027.

A brief assessment by the Appraisal of financial management procedures revealed some weaknesses in financial management systems at WASA Faisalabad. The external auditors in charge of the last financial audit that has been conducted for WASA Faisalabad (2013-2014) reported in their “Disclaimer of Opinion” that the system lacks to some extent professional oversight of financial operations and found a number of deficiencies in the financial accounting and recording system. The Deputy Director of Finance informed the AT that these deficiencies have been removed and the financial records corrected. WASA is in the process of hiring external auditors to conduct audit for the last four years. However, there is no internal audit function to provide financial safeguards, checks and balances with high level of transparency and accountability. The internal financial management system of WASA should be designed to conform to best practice for corporate utilities.

The Water and Sanitation Agency of Faisalabad was established in 1978 under the Punjab Development of Cities Act. WASA acts as an agency of the Faisalabad Development Authority (FDA). FDA is a semi-autonomous institution responsible for undertaking and monitoring planned developments in the city of Faisalabad and acts as a regulatory authority for overseeing the construction of houses, commercial

Key functions of WASA include:

- Planning, design and construction of water supply, sewerage and drainage facilities for new construction works and rehabilitation and augmentation of the existing system.
- Operation and maintenance of water supply, sewerage and drainage system.
- Billing and collection of revenue for the services provided to consumers.
- Since its establishment WASA has achieved an increase in Water coverage from 50% in 1978 to 72% in 2017 in the WASA Faisalabad service area and sewerage coverage has increased from 40% in 1978 to 70% in 2017.
- Although WASA has performed in satisfactory manner and shown tangible results, it has limited experience in managing wastewater treatment plants. One wastewater treatment plant is operational in Faisalabad. The current operation activity of the existing facility at the Chokera WWTP in the Western Zone of Faisalabad is very limited, and the facility operates one water treatment system for water supply, recently completed and handed over by AFD to WASA. This facility is operating sufficiently, and it has been assessed that current departments of WASA Faisalabad have competences available and that the WASA would be able to operate a WWTP if sufficient resources are assigned and capacity built.
- WASA has already taken an initiative to establish a separate Project Management Unit (PMU), which will be staffed with dedicated persons to run the project and participate in training to be able to operate the plant.

To strengthen the O&M team in WASA the contractor appointed to construct the plant will also be assigned for five years of Operation and Maintenance support.

WASA runs a Citizen Liaison Cell staffed with five employees and headed by a sociologist who bridges the communication gap between WASA and customers through active participation in the community. The Cell has adequate capacities to work with information campaigns and e.g. works together with the Customer Relation Centre for enhancing recovery of water and sewage bill.

Financial Sustainability

The financial analysis in the Feasibility Study concludes that full recovery of O&M costs related to the future WWTP will not be possible in the short run and that a gradual increase of tariffs both for domestic, commercial and industrial consumers is required. The AT notes that WASA is already today incurring a budget deficit on O&M of its water supply and sewerage services.

In November 2018 the FDA has approved an increase of tariffs as suggested by WASA which is a step towards bringing tariff income in line with expenditure and WASA has requested GOP to substantially augment the yearly subsidy to the utility. Final approval from provincial government is pending.

The Chairman of the Planning and Development Board in the Government of Punjab in Lahore has indicated to the AT that tariff increases are a sensitive political issue but that GOP will ensure full recovery of the O&M costs of the WWTP through a gradual increase of tariffs and an increase of the provincial subsidies currently given to WASA.

Tariffs

- Based on the current revenue, full recovery of O&M costs related to the future WWTP will not be possible and a gradual increase of tariffs both for domestic, commercial and industrial consumers is required.

- Cost of waste water treatment represent in many countries the largest part of water tariffs and is difficult to collect, as the user consider tariffs only to cover the visible service of water supply. In countries where availability of water is limited users are unwilling to pay. Governments need to improve water supply hours, increase tariffs and improve compliance. The authorities of Faisalabad has for several years worked for realizing all three instruments.
 - Government of Punjab has pledged to ensure full recovery of the O&M costs of the WWTP through a gradual increase of tariffs and/or an increase of the provincial subsidies currently given to WASA. In November 2018 the Faisalabad Development Authority approved an increase of tariffs as suggested by WASA, which is a step towards bringing tariff income in line with expenditure, and WASA has requested government of Punjab to substantially augment the yearly subsidy to the utility. Final approval from provincial government is pending.
- In general tariffs on water is differentiated after type of consumer (household or industry), as well as on income status of consumers to ensure that the poorest part of the population has the lowest level of tariffs.
- Whilst it is understood that government assurances must be taken at face value, international experience regarding promised tariff increases has not generally been positive – thus, although the issue has been covered at some length at appraisal stage (see below also) the rating for JC is adjudged as ‘Partly Satisfactory’ as resolution of a number of the identified concerns depends upon government pledges to remedy the situations (although the arrangement for the contractor to operate the plant and train operatives for a 5 year period post implementation gives some degree of ‘comfort’).
- JC Rating - N/A as project has not yet been built. Potentially partly satisfactory

EQ 7 Overall Rating – N/A as project has not yet been built. Potentially partly satisfactory

Satisfactory development outcomes are expected to be delivered but there is some doubt about the coverage and completeness of specified outputs in that only 2/5 actually refer to outputs (i.e. outputs 1 & 2) whilst 3/5 are actually outcomes delivered by operation of the infrastructure, as is the single outcome indicator specified (which refers to the technical performance of the infrastructure). Given that the project is expected to contribute to various SDGs as noted above, it is suggested that outcome indicators could be specified referring to these SDGs (e.g. beneficiary populations, water borne disease transmission, quality testing of discharge waters, biogas production) .

It is clear from the project objectives and from the identified output and outcome targets that a strong ESG performance is expected from the project by comparison with the specified 2018 BL. The WWTP will provide a substantial contribution to reducing the detrimental impact on the environment and on human health caused by the discharge of untreated wastewater directly into the environment. The project will also have a positive effect on the quality of agricultural products and especially on food products as access to polluted wastewater will be prevented along the Channel n° 4 and the quality of irrigation water in the Gogera irrigation canal, to which the WWTP will discharge the treated wastewater will improve. Finally, the WWTP contributes to ensuring sufficient drinking water in Faisalabad, as part of the treated wastewater will be used as raw water for a future French funded drinking water treatment plant.

Financial returns are in doubt due to current tariffs and subsidies not covering operational costs. Whilst it is understood that government assurances must be taken at face value, international experience regarding promised tariff increases has not generally been positive. As regards financial and portfolio performance there are concerns about WASA institutional, operational and financial performance even though the first 5 years of plant operation will be managed by the DBOT contractor before handover to WASA. Assurances have been given on provision of O&M budgets and tariff increases but international experience has not generally been positive about delivery of such commitments.

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
The financial analysis carried out during the FS concluded that the project is not viable on commercial terms and recommended that the project can only cover associated operation and maintenance cost if the project is financed by DSIF with an approximately 35% grant component and with gradual increases of tariffs within affordability limits ¹³³ .	
JC Rating – N/A as project has not yet been built. Potentially Partly Satisfactory	
JC 8.2 Level of commercial/financial viability of infrastructure	
I-7.2.1 - AR and monitoring documents comply with on-lending, on-investing conditions.	
There are reservations expressed about financial and operational sustainability and viability which can only be expected as a result of fulfilment of major commitments by WASA. Assessment of the overall conclusion on financial sustainability The financial analysis undertaken in the FS has been based on OECD’s “Ex Ante Guidance Gained under the “Helsinki” Tied Aid Disciplines, Revised 2005”.	

¹³³ Feasibility Study for Faisalabad Wastewater Treatment Plant. SWECO Danmark A/S in collaboration with Halcrow Pakistan. Final version. October 2018

The analysis made by the AT confirmed the conclusion of the FS and on the basis of the present tariff structure, the provision of water supply and wastewater services by WASA to domestic, commercial and industrial consumers is financially unsustainable.

The analysis carried out in the FS suggests that with a front-loaded nominal tariff increase of around 115% in 2019 and with a gradually reduced increment every year WASA will have sufficient revenue to cover 110% of its annual operation and maintenance payment obligations and achieve a sustainable and self-sustaining financial operation by 2027 when the O&M of WWTP will be handed over to WASA.

The tariff increases proposed by WASA meet the FS proposal for 2019 and the AT notes that a differentiation of tariffs considering the capacity to pay of the poorest communities has been maintained. However, continued increases of tariffs over the years to come will be required in order to achieve full recovery of O&M costs in 2027, if needed combined with an increase of the yearly provincial subsidy to WASA. Whether such increases actually occur is an open question.

WASA financial performance

An analysis of budget data and of billing and collection data for WASA Faisalabad shows that collected water and sewerage charges cover about 48% of total operating costs (Fiscal Year (FY) 2017-2018). Other budgetary receipts are from urban immovable property tax, GOP subsidy and miscellaneous receipts.

WASA is incurring a deficit in the expenditure budget for its water supply and sewerage services as compared to the revenue. The operating deficit in FY 2017-18 was approximately PKR 160 million (operational budget only), which was met with a series of austerity and corrective measures by WASA to reduce recurrent expenditure.

There are several factors explaining this deficit. These include among other:

- Tariffs for water and sewerage services for domestic customers have been frozen since 2006
- The subsidy given to WASA Faisalabad by the Government of Punjab (PKR 262 million per year) has been frozen since 2013
- Collection efficiency on water supply and sewerage bills remain modest (53% in the fiscal year 2017-18). WASA Faisalabad has to some degree been able to enhance its financial performance over the last years as a result of a number of initiatives such as installation of water meters with support from the World Bank and a more efficient collection of bills. The collection efficiency has thus augmented from 47% in the fiscal year 2011-12 to the present level
- A large part of water consumers are not billed on the basis of their actual consumption in the absence of meters. It is estimated that 20,000 connections are metered out of a total of 120,000 total connections in Faisalabad
- Operational expenditure of WASA has increased substantially due to increase in e.g. electricity tariffs, salaries/pension, and petroleum/oil/lubricants prices, adding up to insufficient increases of tariffs to reflect actual O&M expenditure.

Measures taken to improve WASA's financial performance

Tariffs for commercial and industrial consumers were increased in October 2016. This increase implied an increase of 50% in average for commercial and industrial water supply consumers and 50% in average for industrial and commercial consumers of sewerage and wastewater services (ranging from increase of 25% for large industrial units to 100% for small commercial and industrial units).

A further increase in water and sewerage tariffs for domestic, commercial and industrial consumers ranging from 50% to 100% for domestic water and sewerage charges and more than 100% for commercial and industrial consumers, proposed by WASA, has been approved by the governing body of Faisalabad Development Authority on November 26, 2018. Furthermore, a request to substantially increase the operational subsidy frozen since 2013 been sent to the provincial government through Secretary HUD & PHED. These increases cover one of the main assumptions for the proposed tariff structure suggested in the FS and the Project Document. The funding requests are pending approval from GOP: If approved, these increases will have a positive impact on the budgetary position subject to increase in quality service provision and coverage of WASA.

In addition to the proposed tariff increases and an increase of the GOP subsidy, the FDA has approved a number of other measures aiming at enhancement of WASA's financial performance:

- With a very limited number of meters installed in the WASA Faisalabad service area, water and sewerage tariffs are most often charged at a flat rate based on size of plot of land and connection. Installation of meters has started with the support of i.e., the World Bank. Installation of meters is likely to immediately have a positive impact by increasing revenue collection, improving WASA's cash flows, debt collection charges and allowing more resources to be used for promoting efficient use of water and better sewerage practices.
- The number of industrial consumers is very low due to dependence on individual ground water-based water supply systems for which an aquifer fee is charged by WASA which has also been increased.

Other initiatives that could be taken to enhance financial sustainability and enhance service levels include:

- Non-revenue water is estimated between 35 and 45 percent in all utility companies in Pakistan. Considering the fact that each cubic meter lost, whether through non-recorded use, or through physical losses, is valuable in terms not only as a resource, but also as possible income for WASA. Common approaches to reducing losses are through focussed projects in which District Metered Areas (DMA) are delineated. These allow the utility to find and repair leaks and other network bottlenecks. Furthermore, a structured leakage detection and repair process as part of network management would further reduce losses and repair leaks on short notice. This would also improve relationships with users because disruptions to services will be reduced.

Non-revenue water, lack of meters, low tariffs, insufficient subsidies are all issues which have a bearing on financial and operational sustainability not only of the WWTP but WASA as a whole and analysis made at appraisal confirmed the conclusion that on the basis of the present tariff structure, the provision of water supply

and wastewater services by WASA to domestic, commercial and industrial consumers is financially unsustainable (in the 2017-2018 FY revenues covered less than 50% of operation costs). DSIF accepts government commitments regarding tariff reform and provision of adequate operational budgets for the WWTP whilst noting also other activities (some supported by other sector IFIs e.g. WB) to reduce non-revenue water including programmes to install meters. International experience is not encouraging in delivery of politically sensitive tariff increases.

JC Rating - N/A as project has not yet been built. Potentially Partly Satisfactory

JC 8.3 Level of improvements in ESG achievement

It is clear from the project objectives and from the identified output and outcome targets that a strong ESG performance is expected from the project by comparison with the specified 2018 BL. The WWTP will provide a substantial contribution to reducing the detrimental impact on the environment and on human health caused by the discharge of untreated wastewater directly into the environment. The project will also have a positive effect on the quality of agricultural products and especially on food products as access to polluted wastewater will be prevented along the Channel n° 4 and the quality of irrigation water in the Gogera irrigation canal, to which the WWTP will discharge the treated wastewater will improve. Finally, the WWTP contributes to ensuring sufficient drinking water in Faisalabad, as part of the treated wastewater will be used as raw water for a future French funded drinking water treatment plant.

JC Rating – N/A as project has not yet been built. Potentially Satisfactory



EQ 8 Overall Rating - N/A as project has not yet been built. Potentially Partly Satisfactory

Social and environmental sustainability cannot be assured at this stage but prospects are positive. However, levels of commercial/financial viability give serious cause for concern (this EQ has been rated 'Partly satisfactory' largely on the basis of the level of attention given at feasibility and appraisal; however there is a cascade of issues which add to doubts about financial performance and sustainability including low tariffs, O&M budgets, revenue collection, non-revenue losses and billing)

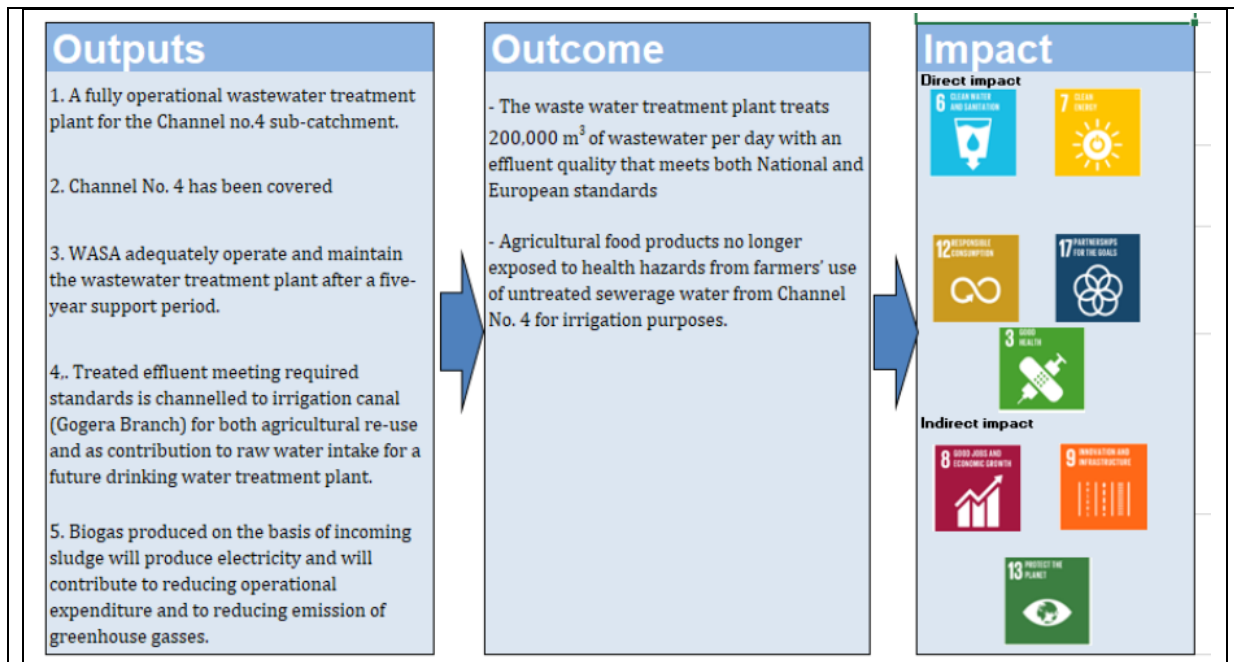
EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?				
JC 10.1 Quality of risk management systems and policies on long-term sustainability					
Multiple risks were identified under headings: Contextual, programmatic and institutional at both Concept and Appraisal stages (interestingly no financial risks are identified). At Concept stage the risks are characterised as follows: The feasibility study identified and assessed potential risks to the project. This included risks related to the institutional human resource, financial and organisational capacity, technology, corruption, as well as risk in relation to human rights, to livelihoods of possibly affected communities and the environment. Risk Management Matrix. Risks that could affect the project include natural disasters exacerbated by climate change, political unrest, a worsening of the human rights situation and terror. These could lead to situations where the project would not be feasible or had to be stopped during construction. However, these risks are not directly related to the project, and in general, they are hard to mitigate. The risk matrix included in project documentation:					
Programmatic risks	Risk Factor	Likelihood	Impact	Risk response	Background to assessment
	Contractors may not be interested in the project.	Unlikely	Significant	The Danish Embassy in Islamabad is constantly working to give Danish companies a realistic picture of living and working conditions in Pakistan. DSIF team in IFU has consulted with possible interested companies. Danish Embassy and DSIF will continue to promote the project among Danish contractors.	Pakistan is relatively stable but still subject to sporadic terror attacks and political/social unrest. Insurance premiums on contracts in Pakistan are relatively high. The size of the project is limiting the number of potential bidders.
	Farmers will break the cover over the covered Channel no.4 to take polluted water from the channels for	Likely	Major	WASA's Citizens Liaison unit will carry out awareness campaigns among the farmers in collaboration with Health Department, and Food Authority. The Irrigation Department will provide	Until now farmers have illegally used raw wastewater from draining channel no. 4 thus adversely affects the quality of agricultural food

irrigation of their fields.			advice on local wells and irrigation. Further, WASA, EPA, health and food authorities will strengthen the enforcement of current laws.	produce and the health of consumers.
WASA Faisalabad does not have the capacity and the human resources needed for the management of the project and for ensuring adequate operation and maintenance of the facility.	Unlikely	Major	The PMU, to be staffed with primarily permanent WASA personnel, will benefit from technical assistance in the tendering phase of the project. Furthermore the DBOT contractor will provide operation and maintenance training of WASA staff for a period of 5 years. WASA Faisalabad has already taken steps to ensure funding for the recruitment of 16 staff members for the PMU and of 70 staff members for the O&M of the new facility.	WASA Faisalabad has a good reputation
Tariffs not increased sufficiently to cover O&M costs on a sustainable basis.	Likely	Major	The Government of Punjab has confirmed that they will ensure that sufficient funding is available to WASA for future O&M costs. A new proposal for increased tariffs has been submitted to the government of Punjab. Donors have a shared interest in pushing the provincial government to continuously increase tariffs and/or subsidies and it has been agreed that there will be a joint approach to ask Government of Punjab for a commitment.	Based on the results of the financial analysis performed by the feasibility study team, the project is not viable on commercial terms and thus qualifies for DSIF financing. The project can cover all associated operations and maintenance costs on two conditions: i) the project is financed by DSIF with 35% grant component, and ii) the tariffs are increased within affordability limits. Industrial tariffs were increased by 50% in 2016. Both industrial and domestic tariffs were increased by more than 100% in 2018.
Contextual risks Risk Factor	Likelihood	Impact	Risk response	Background to assessment
The project will not be able to produce the standards for effluent, as existing industries may not relocate from the city to a new industrial zone, hence pollution levels from factories in the city will not diminish.	Very likely	Major	The wastewater treatment plant (WWTP) is designed for the current industrial pollution loads. On-site pre-treatment of industrial wastewater from companies located in the city is currently being tested and promoted. This initiative may reduce the existing level of pollution. WASA has indicated that the organisation will enter into agreements with industries without a pre-treatment on-site facility to ensure adequate payment of wastewater	Currently, most industries in Faisalabad discharge wastewater directly into the sewerage system. No new industry will obtain approval for location in Faisalabad city and the expectation is that the pollution will decrease, as new and existing industries are moved to an Industrial zone. The basic infrastructure of the zone is not yet fully in place. Despite the incentives provided, the relocation is progressing slowly and may take another 10 years or more.

Abuse of human rights, in particular Labour conditions, child labour and forced labour and other rights directly related to the project	Likely	Significant	DSIF has no-objection right to main contract under the project and will ensure that provision in regard to relevant human rights issues are reflected in the WASA's works contract with contractor. The construction and supervision consultant will have the responsibility of monitoring the works contract and the DSIF independent monitoring consultant will be charged with the task of monitoring adherence with HR the identified HR issues, including local subcontractors.	International observers report on significant abuses of human rights both on the part of public and civilian actors. Lack of accountability and abuses are often unpunished thus fostering a culture of impunity. Use of child labour is widespread.
Security situation for international staff at project site.	Likely	Major	Sufficient security arrangement will be needed on the construction site and for the staff of the contractor, which are included in the budget Due to the long-time perspective of implementing a DSIF project and the uncertainty of final cost estimation before final works contract is signed a considerable budget margin is included in all projects (25 pct.).	The Danish Embassy closely monitors the situation of terror and its targets. No westerners has been targeted in Punjab province since 2009. Most protests are directed towards government institutions e.g. the police and military.
<i>Institutional risks Risk Factor</i>	<i>Likelihood</i>	<i>Impact</i>	<i>Risk response</i>	<i>Background to assessment</i>
Risk of being associated with a major corruption scandal in the DSIF support.	Unlikely	Major	Strong monitoring procedures will be put in place. If corruption is uncovered, funding will be suspended during investigation, and further controls will be introduced.	The contractor is paid directly through a Danish bank. Danish companies bring their reputation at risk by getting involved in bribes. Hence corruption is unlikely to occur, but if it does, implementation will be affected
<p>The main assumptions for the project as set out in the project documentation are :</p> <ul style="list-style-type: none"> Improving the sanitation situation in urban areas will continue to be highly prioritised by the Government of Punjab. Government investments in the water and sanitation sector have steadily increased over the last 10 years and one of the Provincial Government's objectives is by 2025 to develop mechanisms for reuse, recycle and recharge of wastewater for other municipal and productive uses in all major cities. Continued high priority to the sector is paramount to further enhance the sanitation situation in Faisalabad and to ensure adequate funding of WASA operations and maintenance. WASA has sufficient land for the new WWTP. Trickling filters have been selected as the preferred option for treatment of the project wastewater for several reasons: low capital and O&M costs and low land requirements. Thus there will be no need for resettling populations. Depending on the outcome of the detailed design, acquisition of additional land by WASA for pumping stations may be needed but will not exceed 0,5 hectare.. WASA in collaboration with Health Department and Food Authority will carry out an awareness raising campaign among local farmers to sensitise them on the risks related to the use of untreated wastewater with a successful outcome. Environmental Protection Agency will continue to carry out and even strengthen the control of industrial wastewater as prescribed by the law. The discharge of untreated industrial wastewater will not increase over the 10 coming years, as new industrial facilities are prohibited in the city and will be located in the new industrial zone outside the city. It is expected that existing industries in the city will have to install pre-treatment facilities or move to the new industrial zone. Hence, wastewater from industry is expected to stagnate in the coming years. The technical design of the project is built on this assumption. <p>Operational and financial sustainability is a concern dependent upon fulfilment of commitments by the Provincial Government regarding tariff increases, subsidies and staffing albeit that immediate risks are mitigated by the contractor operating the facility for the first five years after construction during which period training of operatives will be carried out.</p>				

JC Rating – Partly satisfactory 
JC 10.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio
Given that construction has not yet begun there has not yet been any progress reporting (at output level). However, a 'Revised Project Results Framework' has been prepared (see JC 7.1 above) notwithstanding that reservations are expressed about the coverage of specified outputs and outcome indicators. JC Rating – N/A
EQ 10 Overall Rating – Partly satisfactory 
There has been consideration of a wide range of risks and assumptions at both concept and appraisal. Multiple assumptions and risks were identified at contextual, programmatic and institutional levels (interestingly no financial risks are identified) together with assessment of likelihood of occurrence, impact and risk response/mitigation measures. At appraisal stage there is greater focus on operational risks including adequacy of capacity and financial resources for management and operation of the facility. Operational and financial sustainability is a concern dependent upon fulfilment of commitments by the Provincial Government regarding tariff increases, subsidies and staffing albeit that immediate risks are mitigated by the contractor operating the facility for the first five years after construction during which period training of operatives will be carried out. Although it is accepted that government commitments should be taken at face value international experience of such commitments regarding tariff increases and operational budgets is not encouraging. Given that construction has not yet begun M&E systems and reporting on implementation are not yet operational and there has not yet been any progress reporting (at output level). However, a 'Revised Project Results Framework' has been prepared although reservations are expressed about the coverage of specified outputs and outcome indicators.

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
A narrative 'Theory of Change' was produced at concept stage. <u>Theory of Change</u> The sewerage treatment system of the city of Faisalabad is in a very poor condition with significant adverse impacts on the surrounding communities and environment. Untreated wastewater is discharged directly into the river contaminating the environment and negatively affecting consumers downstream – households as well as local farmers who use the water for irrigation. The local water utility (WASA) wants to establish water treatment facilities in the eastern and western zones to reduce adverse effects to the environment and improve the livelihood of local farmers and households. The overall assumption for the support is that Punjab Provincial Government will continue to prioritize treatment of wastewater and that Faisalabad WASA has the capacity and sets aside resources needed for the management of the project. It is further an assumption that the Environmental Protection Agency (EPA) carried out the control of industries as prescribed by the law, in order to prevent e.g., industries from letting out wastewater with higher pollution than prescribed by the law. It is also assumed that farmers do no longer use polluted wastewater for irrigation of their food crops. A technical solution to the presently open channels leading the wastewater from the sewerage system to the WWTP is included in the project (i.e. covering the channels to prevent access. Furthermore, Agence Française de Développement (AFD) intends to finance a project using the treated wastewater from the Danish financed Faisalabad WWTP for irrigation available to the farmers. In addition, it is a critical assumption, without which the project will not be viable, that Danish contractors are willing to bid. Danish companies have been consulted and expressed that they would be interested in the project.	



Main Assumptions (output to outcome)

- WASA Faisalabad has the capacity and financial resources needed for the management of the project and for ensuring adequate operation and maintenance of the facility.

- The discharge of untreated industrial wastewater will not increase over the 10 coming years.

An successful awareness raising campaign among local farmers, together with available alternatives for irrigation will cease the habit of using water from canal 4 for irrigation.

Main Risks

- Tariffs not increased sufficiently to cover O&M costs on a sustainable basis.

Main Assumptions (outcome to impact)

- The government of Punjab will continue to prioritise wastewater and drinking water services to Faisalabad city by implementing the development plan, including the 4 wastewater treatment plans and drinking water plants.

-Treated wastewater will be used as raw intake for AFD surface water treatment plant and farmers along the Gogera Canal will use effluent from the project for irrigation (SDG12)

Main Risks

- Farmers will break the cover over the Channel no.4 to use polluted water for irrigation of their fields

As noted above there are reservations expressed over the specified output and outcome indicators but there are a number of key assumptions made regarding the issues which will affect the operational effectiveness and sustainability of the WWTP and it is suggested that these fulfilment of these assumptions and risk mitigation should form a component of the RMS especially post completion of implementation during the 5 year period in which the plant will be operated by the contractor.

JC Rating – Partly Satisfactory 

JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

Given that construction has not yet begun there has not yet been any progress reporting (at output level). However, a 'Revised Project Results Framework' has been prepared (see JC 7.1 above) notwithstanding that reservations are expressed about the coverage of specified outputs and outcome indicators.
JC Rating – N/A

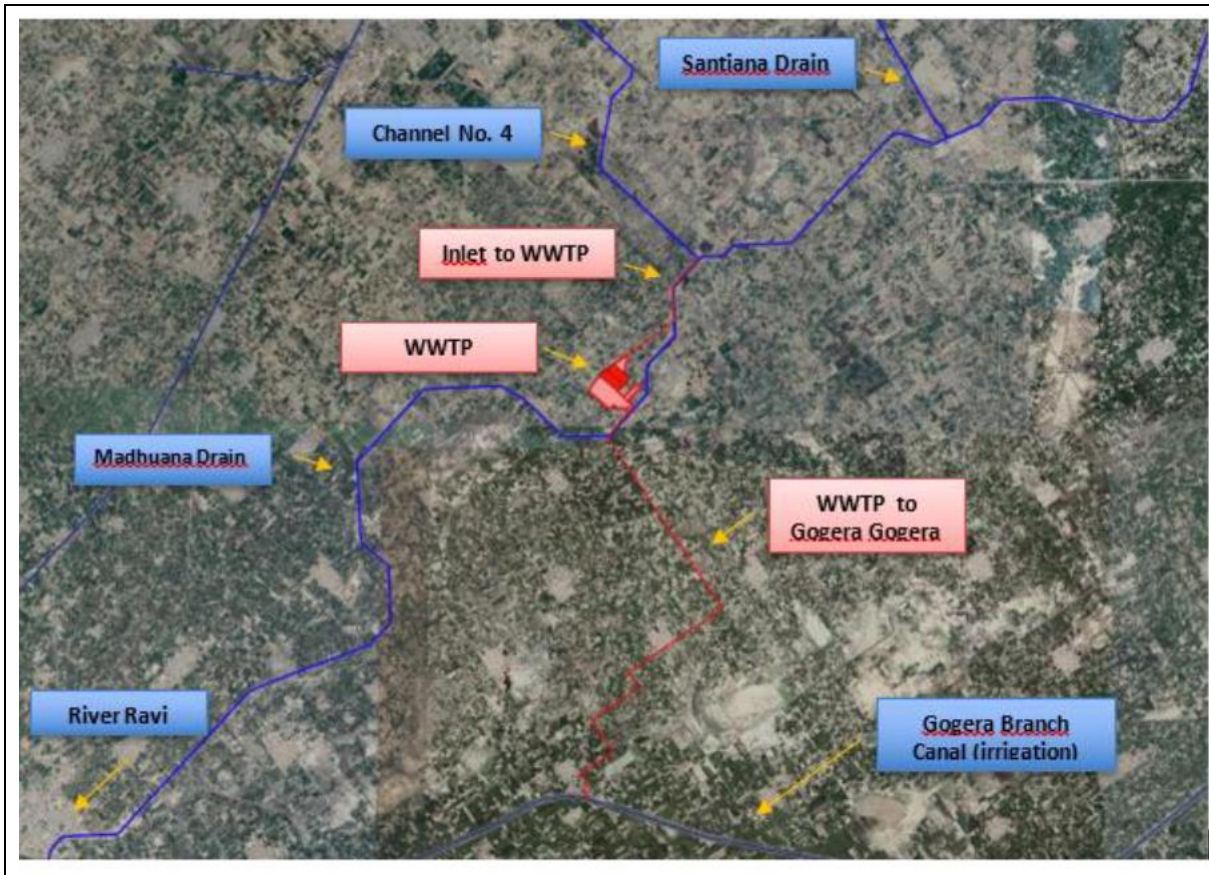
EQ 11 Overall Rating – Partly Satisfactory ●

The narrative 'Theory of Change' captures the essential project thematics and linkages between proposed solutions to the identified problems (although, given the stated doubts/assumptions about institutional, operational and financial sustainability there is some concern that a 'cutting edge technological solution' might be somewhat ambitious for the noted fragilities even though the first 5 years' operations will be handled by the contractor). This concern is increased by the assumptions which include EPA enforcement of national environmental laws (not previously enforced) and changed farmer behaviour regarding use of foul water for irrigation in addition to previously stated assumptions regarding adequacy of OM budgets and tariff increases. Also there are reservations expressed over the specified output and outcome indicators but there are a number of key assumptions made regarding the issues which will affect the operational effectiveness and sustainability of the WWTP and it is suggested that these fulfilment of these assumptions and risk mitigation should form a component of the RMS especially post completion of implementation.

Given that construction has not yet begun there has not yet been any progress reporting (at output level). However, a 'Revised Project Results Framework' has been prepared (– see JC 7.1 above) notwithstanding that reservations are expressed about the coverage of specified outputs and outcome indicators.

Images

Overview of WWTP and new pipelines (illustrated in red) and existing drainage channels (blue) in East Faisalabad.



Case study: Vietnam

16 Vietnam: Ba Don Drainage & Sanitation

Overview

<i>Key issues, highlights and lessons learnt</i>
<p>Serious unresolved dispute between SUEZ (contractor) and employer (local People's Committee) . Danida in 2019 threatened to cancel a €1m grant for additional work. 70% of the work has been done, although the most complex parts of the work are still to be constructed/installed. A key matter is who should do household (HH) connections behind the fence. The connections are actually part of the contract, but Suez argues that the budget for this too low. Danida grant of EUR 1m is not sufficient. There is as of June 2021 still no resolution to the dispute and the project is at a high risk of cancellation. However new politicians at local level may alter the status quo.</p> <p>Interviews by Particip with both Suez project manager and the PMU director suggest that there are still considerable obstacles for restart of the implementation. It would appear that neither is prepared to cancel the project as the financial consequences would be significant.</p> <p>Given the dispute it was neither appropriate nor practical to undertake a field visit.</p>

<i>Summary</i>						
Project name	Ba Don Drainage and Sanitation Project					
Type of project	Surface and wastewater drainage networks construction and, wastewater treatment plant					
Project No.	104.O.30.Vietnam.MOF.21					
Description	<p>The project's development objective is to improve urban environmental conditions in a sustainable manner through the construction drainage and sewerage networks and wastewater treatment plant, and improvements in urban environmental sanitation facilities. At the time of appraisal, no drainage or sewerage networks existed, and wastewater was being discharged untreated into rivers.</p> <p>The proposed project for Danida support comprises:</p> <ul style="list-style-type: none"> • 6.500 households with connections to the new sewerage network • Separate surface and wastewater drainage networks serving Ba Don Town and parts of the surrounding communes; • 3.000 m³ per day capacity wastewater treatment plant; • Supporting environmental sanitation facilities; and, • Institutional and capacity development of operator of infrastructure to be constructed. 					
Sector	Water and Sanitation					
Country	Vietnam					
Sponsor	Danida and MoF, Vietnam					
Other stakeholders	Provincial People's Committee, District People's Committee, PMU, Ministry of Planning & Investment.					
Clearance in principle	Probably in 2016, no info available					
Approval/Binding Commitment	2009	Loan / Investment Agreement Date			Letter from Nordea to MoF June 2016	
Danish Bank	Nordea					
Loan Duration + Grace Period	10 years, repayment in June 2019					
Project Amount and funding plan	Total contract € 8,98m, Contribution from Vietnam €2.1m, €6.9m from DSIF					
Danish Exporter	SUEZ A/S					
MFA guarantee	Date	2016	Amount	€ 07m	Duration	10 years
Implementation status	According to table DSIF project list it is closed in 2016, but latest Suez PP is from October 2019 where implementation is still in principle ongoing but in practice stalled.					

Summary	
Feasibility study details	Contains the technical, financial and O&M proposal for drainage network and build a wastewater treatment plant. Made by Quang Binh Provincial People's Committee.
Subsidy – rationale and key features	<p>The financial analysis in the project document demonstrated that high wastewater tariffs were necessary to make the project sustainable under commercial conditions. However, tariff increases of this nature were considered unrealistic in Vietnam. Thus, it was proposed that tariffs start at DKK 0,82 / m³, which corresponds to approx. 3 pct. of the minimum income in Vietnam. Hence the project was not viable under commercial conditions, but that the project with a mixed credit financing would be profitable with a rate that does not exceed 3 per cent. of the minimum wage.</p> <p>The socio-economic benefit of the investment was difficult to estimate. However the positive effects associated with the project were deemed significant. These included an improvement of the state of health and the standard of living in general in the project area. In addition, there were the expected indirect and harder to quantify benefits related to the development of local business and thereby local job creation.</p>
Country Context	<p>High economic and population growth (the latter around 3,5% annually) has led to increasing environmental challenges as many areas are facing difficulties in proper development of infrastructure to sustain the increasing industry and population. All indications are that this will put additional pressure on the need for waste management and water treatment. The urban districts in the provinces are especially faced with difficulties in securing financing for the necessary rehabilitation and extension of the infrastructure, replacement of outdated equipment and other needed initiatives.</p> <p>Denmark has a long history of supporting water and sanitation in Vietnam going back to the 1990s. This was primarily grant funding (over DKK 1bn) firstly focused mainly on urban areas, from 2000 onwards also including rural ones. It primarily took the form of sector budget support to the government, pooled with other donors (AusAID, DfID, WB and the Netherlands) that also included engagement at policy level aimed at making the financial and regulatory framework more conducive and sustainable, e.g. through raising water fees.</p> <p>Ba Don Drainage & Sanitation project supports the Vietnam national development strategy "Orientation Plan for Urban Drainage to 2025 and vision to 2050" that aims for treatment of 70-80 per cent of household wastewater in 2025 and full treatment in 2050. Vietnam has adopted a national strategy that includes standards for industrial discharge of wastewater. Denmark supports the national water and environmental strategies with the Water and Sanitation Sector Programme from and the Environmental Sector Programme and the project will contribute to these efforts.</p>


Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The project is aligned to the objective of poverty reduction through providing access to safe water and standardized wastewater treatment systems. The appraisal states the project will contribute to 'reduction of poverty by allowing population to access public services with abundant environmental health benefits' (p. 29). This was fully in line with both Danida's global policies as well as the Danida country strategy at that time which has the water and sanitation sector as a key priority, both for the grant programme and for DSIF.¹³⁴ However, there is no real explicit explanation of the causal drivers between the improved sanitation and poverty reductions (e.g. that poorer households would benefit), but this is implicitly assumed. However these causal links are generally well documented globally.¹³⁵ Nevertheless there is limited documentation on e.g. how many of the connected households are poor.</p> <p>The appraisal report assessed coherence with DSIF (then mixed credit facility) strategy and policies and concluded that the Ba Don was 'directly related to the general stated objective of the mixed credits, i.e.: to</p>	

¹³⁴ Danida: Strategy for Danish Bilateral Development Cooperation with Vietnam, 2000 and Danida. Water supply and sanitation , Danida sector policies, 2000

¹³⁵ See e.g. Bosch, Christophe, et al. "Water, sanitation and poverty." Draft chapter. Washington DC: World Bank (2001).

reduce poverty, improve standards of living and contribute to economic growth in developing countries. The appraisal also argued that the project aligned to the mixed credit's immediate objective of *helping to mobilise funds for projects that are financially "non-viable" and, therefore, would not be carried out without financial subsidies.* The economic and financial analysis of the appraisal had established that Ba Don drainage and sanitation services are not commercially viable without the support to be provided by the Mixed Credit Facility and hence it complied with the OECD guidance.

JC Rating –  **Satisfactory** In line with both Danida and DSIF policies at that time, as well as those of GoV (see below). However, not much focus on fully evidencing the degree to which the project would reach the poor and improve, inter alia, health.

JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account

Indicators:


The appraisal does mention key GoV documents such as the Socioeconomic Development Plan 2006-10 (SEDP) and Vietnam's Comprehensive Poverty Reduction and Growth Strategy (from 2002). The latter received more attention as it had an explicit goal of treating all urban wastewater by 2010, whereas 95% of the urban population would have access to safe water and 40% of the urban population would have access to standardized wastewater treatment systems, 80-90% solid waste collected, and with environmental problems in all rivers should basically be addressed by 2010.

More specific strategies are also mentioned including the National Orientation for the Development of Urban Sewerage and Drainage which stipulates that all urban areas should have suitable drainage system and wastewater treatment facilities by the year 2020. Urban drainage was targeted at supporting urban modernization and industrialization as well as environmental protection. Moreover the appraisal report also refers to the Vietnamese Environmental Strategy 2010 according to which 40% of wastewater generated in urban areas must be treated by the year 2010. Finally the appraisal also details the Solid waste management (SWM) policy which is composed of two strategies: (a) the Management of Solid Waste in Vietnamese Cities and Industrial Parks - Strategy to 2020 (1999), and (b) the National Strategy for Environmental Protection – Strategy to 2020 (2003). Their focus included: i) legal reform, ii) awareness and training, iii) privatization and cost recovery, iv) use of appropriate and modern technologies, and v) promotion of economic approaches to environmental protection.

All in all there is good alignment and coherence to GoV's development policies and strategies. However there is no thorough analyses of these policies and strategies, but it can be assumed that the project did align to those, otherwise GoV at various levels would arguably have objected.

The feasibility study was done by the district authorities thus reflecting their views and the appraisal largely concurs with these, but do add additional requirements for e.g. works health and safety, removal of septic tanks and the adoption of a simple treatment process with simple skills requirements. This had been based on intensive discussions with both the local consultant as well as with local authorities. Overall the appraisal reveals reasonable levels of interaction with local authorities as well as a reluctance to follow the feasibility study's recommendations on more complex, expensive and O&M intensive solutions, despite that local authorities also seemed to press for this. The appraisal argued that this would undermine sustainability and increase cost.

At this desk phase GoV opinion has not been solicited, but indications are that the intervention is aligned and that the project stand-still is due to local political issues. More information may be obtained in the desk phase.

JC Rating -  **Satisfactory**, the feasibility was done by local authorities and took into consideration the then ruling policies and strategies. The AR was building on that and also tried to further insert clauses on OHS and labour rights.

JC 1.3 Added value of Project Preparation Facility (PPF)


No support from DSIF for feasibility study or other technical assistance

JC Rating - NA




JC 1.4 Complementarity with development partners operations and strategies

There has been significant donor support to the WATSAN sector from especially ADB, World Bank and Australia and Denmark has generally cooperated closely with these through sector wide programmes that were closely aligned to the government's programmes. The ADB has also provided support to the sector but mainly urban water supply and sanitation, in the form of concessional finance of close to USD 1bn.¹³⁶

However, in the documentation of the project, there is limited analysis of other donors engagement probably a reflection of their absence in the city. The only exception being a Hungarian project in Ba Don to increase water supply capacity which was under preparation during the appraisal (2009). If this project failed to materialise, sewer pipeline blockages could result because of too small water flows to maintain the transport of solids. Thus a key assumption on the outcomes in the waste water portion depended on the completion complementary water supply infrastructure, financed by Hungary. There is no follow on the status of the Hungarian project, but googled media reports suggest it did materialise and complete.

JC Rating :  **Satisfactory**, there seems to be good awareness of the only other donor project in town, although not any information on how the Hungarian supported project developed post-appraisal.


¹³⁶ ADB : 'Vietnam - Water Sector Investment Program' 2011

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts	
<p>The project has been identified by the local municipal authorities supported by central level institutions, thus reflecting both local and national priorities and strategies. Clearly the project, if implemented, will deliver substantial development outcomes in terms of better sanitation and improved environment.</p> <p>This is also reflected in the appraisal report's (AR) description of overall objective which is to improve the living conditions of the residents of the town by minimising pollution and diseases caused by wastewater and lack of sanitation facilities. There are even indicators on e.g. % of people get diseases caused by waste water and environment pollution. However, the indicators are not quantified nor discussed in the report nor in the feasibility study. Moreover, there appears to be no specific targeting of the poorest segments of the population, but if that had been done, the financial (and arguably political) sustainability of the project could have been jeopardised as those with the lowest incomes are probably those with the lowest propensity and ability to pay for the water services. Generally, the link between improving sanitation, health outcomes and raising living standards is robustly demonstrated and it is hence a reasonable implicit assumption to make that the project will improve living standards for both poor and non-poor. However, these arguments and implicit assumptions could have been made more explicitly. Moreover part of the results monitoring framework related to development impacts is clearly copied from the appraisal of the Ha Gaing appraisal (including not replacing the name of Ha Gaing and using identical, but wrong, numbers on households connected and coverage of service areas).</p> <p>JC Rating -  Partly satisfactory. In general, sanitation in a city without any water treatment is clearly having a negative developmental impact for both poor and non-poor and hence any improvement to this situation is delivering development impacts. The local and national authorities have been driving the project selection process and it is generally investment worthy. However, there has not been any targeting nor any quantitative indicators nor baselines. Indeed, the analysis and even some of the numbers have been copied from other appraisals and more efforts could and should arguably have been invested in both evidencing this and in defining context relevant non-plagiarised numbers.</p>	
EQ 1 Overall Rating  Satisfactory: The project has a high degree of relevance for DSIF, MFA, the Vietnamese governments and local partners. The sanitation problems in Ba Don were real and the cost of the treatment plan too high to allow for a fully commercial approach. The relevance for Danish partners may have been somewhat lower, as such medium scale treatment plants do not use particularly innovative technologies in which Danish companies have a unique comparative advantage.	
EQ 2 -Coherence	To what extent has DSIF been able to create coherence with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p><u>ARs assess coherence with MFA policies</u></p> <p>Limited assessment of MFA/Danida, only stating that it contributes to poverty reduction and the improvement of living conditions of all incl. the poor. It continued that the environmental and sustainability principles also adhered to MFA development policies, but made no further reference to MFA policies.</p> <p><u>ARs assess coherence with DSIF strategy and policies</u></p> <p>The DSIF was at that point in time managed by MFA and there was limited explicit DSIF specific strategy and guidance distinct from MFA. However, the appraisal states that the project was compatible with OECD state aid rules</p> <p><u>Evidence for efforts to ensure that projects remain coherent over time</u></p> <p>The project is currently stalled perhaps a bit more than halfway through (65% of civil works is completed according to contractor). There is no evidence of any deviation from the agreed strategy or that it has become incoherent as such, but nor is there any evidence that there are deliberate efforts to maintain coherence. Most attention is on solving the dispute between the contractor and the employer. The dispute is partly attributable to significant discrepancies between the tender and basic design documents and the actual site conditions are detailed surveys were conducted. Moreover, the contractor claims that the employer (People's Committee of Quang Binh) has come up with additional demands not foreseen in the contract.</p> <p>JC Rating -  Partly Satisfactory. The dispute between the contractor and the buyer has been a significant distraction and undermined most other aspects, including that of ensuring coherence.</p>	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p><u>Compatibility of DSIF projects with those of Danida and IFU by sector and country</u></p> <p>It is compatible with the Danida focus on improving living standards and there have been many other projects within water and sanitation both through DSIF and through purely grants. From the mid-1990s to 2005 Danida had a focus on urban water and sanitation followed by a larger rural WATSAN programme from 2005 to 2015 (at which time traditional assistance was being phased out). There has also a large-scale Water and Sanitation</p>	

programme support (WSPS) programme in three phase starting in 2000 and continuing up to 2015 joint with other donors to which Denmark has contributed more than DKK 1bn.¹³⁷

Evidence of exchange and coordination fora, in Denmark and in recipient countries

In general Denmark, mainly through the embassy, has been active in coordination and exchange of information with both government and other donors (with the former typically leading those efforts). Denmark was also a stronger supporter of the core Hanoi statement on aid effectiveness which committed donors to harmonise and align their assistance with the policies, strategies and procedures of the relevant authorities at local and central level. However, there is limited evidence that the project was part of such coordination efforts as it was mainly localised and handled by the contractor and local authorities. Some coordination has probably taking place more informally with the embassy being fully informed and engaged in the project preparation phase.


JC Rating -  Satisfactory, the embassy appears to have been fully informed and engaged at appropriate stages utilising its knowledge of the water and sanitation sector.


JC 2.3 Danish business links with beneficiary countries




Danish equipment in DSIF projects

The equipment used is sources from various countries including Vietnam, France, China but also Denmark. Grundfos has been supplying the pumps, based on the quality and life-costs of these, not due to their Danish country of origin.





Suez A/S is nominally a Danish contractor (Suez Water A/S), but de facto a very small subsidiary of the French company Suez S.A. It appears that the only SUEZ contracts in Vietnam are those financed by DSIF and that it only has had few businesses outside the DSIF funded ones in Vietnam.


JC Rating -  Partly satisfactory, as there are limited links to Danish inputs and wider business with Degremont (which later was renamed SUEZ, but essentially the same French own subsidiary) having very limited presence in Denmark beyond the DSIF funded projects. It has previously cooperation in JV with the Danish contractor MT Højgaard on wastewater and drinking water projects which has helped it establish a small office in Denmark with 11 staff. Degremont has also done projects in China, Egypt, Sri Lanka and Bangladesh, but in the case of Ba Don and other Vietnamese DSIF projects it has not teamed up with any (more) Danish companies. However pumps are sourced from Grundfos, Denmark.





EQ 2 Overall Rating -  Partly satisfactory. There appear to be limited synergies with earlier efforts in the water and sanitation sector (which was mainly grant finance), but it was clearly aligned to the development policy of improving living standards by e.g. upgrading sanitation and increasing climatic resilience. There have only been limited links to the wider Danish business community as a result of the project.

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
The grant element is calculated to be 35% as per OECD notification with EKF providing a 95% guarantee to Nordea. The appropriate notice to Danida Board argues that the subsidies are need as cost-recovery wastewater fees would be prohibitively high. There is no comparison with alternative sources of finance. The financial additionality is principally in the form of concessional funding and grants, which were important given the negative financial rate of return that was demonstrated by the financial analysis that was included in the appraisal study. The primary reason for the lack of financial viability is that tariff, in the short to medium term, cannot cover operating costs. Since the project was not financially viable commercial finance was not possible.	
JC Rating -  Satisfactory, the subsidy is necessary and warranted given the lack of financial viability. In addition there are strong externalities associated with the project, improving the economic rate of return.	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
There is no evidence of any non-financial additionality in the project, but clearly the finance is highly additional	
JC Rating -  Partly Satisfactory, as non-financial additionality is not a requirement	
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	
JC Rating - N/a, no commercial or developmental bank funding was leveraged.	
EQ 5 Overall Rating -  Partly satisfactory	
It is challenging to ascertain if DSIF support to the treatment plant was catalytic, both because the implementation has stalled but also because the counterfactual will require more information from the local level: However there has been an emphasis on OHS that would not have been in place with DSIF's assistance, but the degree to which that was followed in the actual implementation and subsequent operation of the wastewater treatment plant is unknown.	

¹³⁷ See e.g. Danida: Vietnam - Denmark: Transformation of a partnership. Evaluation, 2017.

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
<p>The infrastructure has only been partially implemented (around 60%) and is now stalled as interviews during the field with PMU and the contractor the local corroborated. While the quality of existing infrastructure is probably of reasonable standard (the contractor claims so) the overall implementation is clearly not satisfactory as it has been stalled for a long time and with no prospects of resolution. There is a very real risk that the project will be cancelled without implementation finalised</p>	
<p>JC Rating -  Unsatisfactory, implementation has been stalled and may not resume.</p>	
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
<p>The project appraisal argued that the drainage and sanitation project was part of a drive to create the conditions for economic growth in a rather backward town. Thus, the assumption was that this would attract new investment in higher value- added industries and stopping the migration towards other booming cities such as Hanoi and Ho Chi Minh Cities. It was intended to complement already in place urban, transport and communication infrastructure which are key for economic growth. With implementation stalled it is impossible to verify this, but it nevertheless seems plausible that it would make Ba Don somewhat more attractive both as an investment destination and as a place to live. Again, no quantification was made but it was estimated that the economic rate of return would be above 15%.</p>	
<p>The appraisal argues that the investment would contribute to improving living conditions particularly for the poor with significant economic and environmental health benefits. However while Quang Binh was among the poorest provinces in Vietnam, there is no analysis of what socio-economic groups would benefit from the project. This was also difficult to ascertain as the benefits from e.g. clean rivers are diffused among numerous households and businesses (e.g. fishermen). The construction clearly employed a number of people when implementation was ongoing, but the investment was more capital than labour intensive. In addition the appraisal also envisaged that job opportunities would emerge, derived from productive investment projects in nearby areas, which would complement its current economic base built on agriculture, block stone, cement, beer and tunnel bricks. No quantification of either direct or indirect employment generation has been found, but likely to be modest at best.</p>	
<p>JC Rating -  Unsatisfactory, as no benefits have been delivered and there is a significant risk that the project will be cancelled</p>	
JC 6.3 Environmental, social and governance (ESG) risk management	
<p>The project intended to comply with all relevant national laws and regulation as well as support the national objectives in the sanitation sector. There is no mention of international best practices. As part of the feasibility study, an EIA was undertaken, which provided detailed information on expect impacts both positive (most) and negative (few during implementation). The EIA also contained mitigation measures both in the pre-construction period, during construction and a detailed plan for environmental mitigation during the operation period. The EIA also committed the project owner to a number of environmental protection measures on air and water quality. The contractor also made an environmental monitoring plan (EMP) which was monitored. Gender mainstreaming as such is not addressed in the FS.</p>	
<p>There is an environmental risk assessment table in the appraisal report that also does mention social impacts, other ESG risk are not thoroughly analysed. However, workers' rights and OHS were part of the bidding material, as required by Danida. The appraisal report does discuss the importance of the quality and timeliness of the water supply and removal of waste water and solid waste and the improvements that can catalyse benefits for women. Inadequate provision of these services affects the health of the family and in particular the children, and the children's health tend to still be considered mainly the mothers' responsibility in Vietnam.</p>	
<p>In the external monitoring reports there is a section on Safety, Security and Protection of the Environment, where various aspects are monitored. There is limited monitoring of social and governance issues.</p>	
<p>JC Rating -  Partly satisfactory. Clearly better sanitation benefits both the environment and women (as well as men). Thus it could be argued that there is no strong need to explicitly detail these benefits.</p>	
JC 6.4 Contribution to climate change mitigation, green and inclusive development	
<p>No mention of climate mitigation, but clearly better flood protection is also an adaptation measure. Environmental effects expected to be significant as detailed in JC 6.3 above.</p>	
<p>There is limited direct focus on social inclusion, but clearly by freeing up time through better sanitation such as less work on sanitation issues and more productive worktime due to less illness. This will benefit both poor and rich, but arguably mostly the poor as they suffer disproportionately from poor health and high sanitation workload.</p>	
<p>JC Rating -  Partly satisfactory.</p>	
JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth	
<p>This project was approved before the HP</p>	




JC Rating - NA
EQ 6 Overall Rating:  Partly Satisfactory. There are no impacts due to the project being stalled but basic sanitation and better protection against floods have a high potential in terms of increasing living standards and strengthening resilience against climate change. However, dispute with Suez raises concerns about implementation.

EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)	
No outcomes yet but based on similar projects by same contractor in Vietnam, there could come reasonably good development outcomes and for Suez also good commercial outcomes in Ha Gian, and Vi Thanh both of which are also DSIF supported. JC Rating -  Potentially Partly satisfactory. With no development outcomes and benefits to Danish industry there is doubt both aspects. If the project is eventually implemented there will be clear developmental impacts as also stated by several interviewed. ¹³⁸ Generally all DSIF's water projects in Vietnam have strong technical and political backing and there is thus a high probability that the project will deliver expected benefits, if implemented. However, the dispute threatens to undermine the realisation of the project and there is thus a very real risk the project will be cancelled. Hence the potentially partly satisfactory.	
JC 7.2 Strong ESG performance of DSIF projects	
Limited focus ex-ante on ESG issues and no ex-post data as project stalled. However Suez has, not only in Ba Don but also in its other DSIF projects, strong focus on environmental issues as well as OHS, exceeding local standard and practices. However, the current stalemate also means that there is no progress on these issues. JC Rating -  Partly satisfactory, there has been focus on ESG and sustainable development, but with the project stalled no further progress is made.	
JC 7.3 Satisfactory financial returns and portfolio performance	
Financial sustainability cannot be assessed because to project is not in operation. Bothe the AR and feasibility study, however, suggest that the financial rate of return will be negative due to too low tariffs (but with a positive economic rate of return, assuming the project is finalised). A satisfactory resolution of the dispute with Suez is required for construction to recommence. JC Rating -  Partly satisfactory as the has been clear case with a positive ERR, but negative FRR. However there is a risk of both FRR and ERR turning negative should the project be cancelled.	
EQ 7 Overall Rating:  Partly satisfactory. It is difficult to assess as project construction remains stalled . Hypothetically if the project does produce the planned development outcomes, the project will clearly have contributed to the raising living standards and increased resilience, also benefitting many poorer households and women. Uncertain resolution of dispute puts such outcomes at risk, and at least delays their achievement.	

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
The design suggested that the treatment plant would improve sanitation and increase protection from flooding. More than 6.500 households were expected to be connection to the wastewater pipes and the treatment plant had an initial capacity of 3.000 m ³ /day. However very few activities have been completed. While the number of households has been reduced, there the benefits, if the project is implemented, will still accrue to the remaining households, mostly like in an economically, socially and environmentally sustainable way. Moreover, as there is a strong 'sanitation drive' in Vietnam, it is also likely that the originally target of 6.500 households will be reached eventually. The economic rate of return is not estimated in the AR, but assumed to be higher than 15%, without any supporting calculations in the appraisal document. JC Rating – N/A as project has not yet been built. Potentially satisfactory Judging by the robust performance of the other water-related projects in Vietnam, including ones that have been implemented by Suez, the project will likely be economic viable and improve the environment as well as catalysing substantial social benefits. However an unfinished treatment plant is obviously not economically viable, so the ultimate jury is still out on this one.	
JC 8.2 Level of commercial/financial viability of infrastructure	


¹³⁸ E.g. Ba Don PMU Dictro Nguyen The Hao, 19 April 2021.

<p>The AR showed that there would be a negative FIRR for <i>commercial financing conditions</i>, and the NPV when using a 6% rate of discount would be VND -75.985 million. The FIRR for <i>soft financing conditions</i> would be 8% and its NPV would be VND 1.649 million when using a 6% rate of discount. All figures from the appraisal report.</p> <p>JC Rating - N/A as project has not yet been built. Potentially partly satisfactory based on appraisal forecasts, which may not be fully credible as there was significant flaws in the overall numbers presented and the fact that most projects eventually have been revised downwards in terms of e.g. number of households reached. This was also the case 6.500 in the appraisal but downward revised to 3.000 in the final contract with, obviously undermining the calculations of financial viability.</p>
<p>JC 8.3 Level of improvements in ESG achievement</p>
<p>Higher, sustained ESG standards: lower pollution and social benefits e.g. reductions in gender imbalances, over time – i.e. early and late projects</p> <p>Improving the environment is both a national and regional priority and the project, if implemented, will make a substantial contributions hereto, as the current practice is to use septic tanks that are emptied in rivers, sewers or lakes, with highly detrimental impacts on the environment and public health.</p> <p>JC Rating – N/A as project has not yet been built.</p>
<p>EQ 8 Overall Rating : N/A as project has not yet been built. Potentially partly satisfactory, the project may be economically, environmentally and socially sustainable but the political sustainability/support has arguably suffered as the current stalling of the project testifies.</p>

<p>EQ 10 <i>Project risk management of DSIF</i></p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
<p>JC 10.1 Quality of risk management systems and policies on long-term sustainability</p>	
<p>Due to disputes between Suez and the local authorities, the project is clearly at risk from cancellation which, ceteris paribus, reflect badly on DSIF's risk management. However, it is arguably challenging to predict and mitigate volatile political developments at provincial level, which seems to have been the main catalyst of the dispute. The two other SUEZ wastewater projects in Vietnam are progressing reasonably well, indication that the challenges in Ba Don are due to local political environment.</p> <p>Appropriate trade-off between development policy and financial prudence Yes judged from the pre-implementation documentation.</p> <p>JC Rating –  Partly satisfactory. The dispute undermines everything including sustainability. There is now a high risk of cancellation</p>	
<p>JC 10.3 Quality of environment, social and governance (ESG) risk management</p>	
<p>If implemented, the project will make a significant contribution to the greening of the environment and include many households within the piped sanitation network</p> <p>Limited monitoring but clearly the governance/political risks proved substantial. More information will be solicited in the field phase.</p> <p>JC Rating –  Partly satisfactory based on planned ESG standards in project.</p>	
<p>EQ 10 Overall Rating:  partly satisfactory. The main issue is that the political / institutional risks have been underestimated.</p>	

<p>EQ 11 <i>Result management system</i></p>	<p>What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?</p>
<p>JC 11.1 Quality and appropriateness of RMS</p>	
<p>The development logic in the AR is relatively simple and generic but generally convincing: Better sanitation for all affected residents will improve health and living standards. Moreover the increased security from floods as well as the cleaner water and improved air quality (from treating waste water that hitherto was discharged into rivers) would also make the city and environs more attractive for business and tourist further increasing the developmental impact. The logic or theory of change is not particularly explicit and detailed nor if there are made specific attempts to ensure that targeting of the poorest or reach a maximum number of poorer households is done. However, too strong pro-poor target may have undermined financial sustainability (poor being more unwilling and unable to pay the increased water bill) as well as reducing political and elite backing if the benefits were not widely distributed. Again such analysis is absent in the appraisal but likely implicit in the design, which was done by the local authorities.</p> <ul style="list-style-type: none"> • Quality of SDGs tracking systems and data • There is no SDG nor MDG tracking system but a rudimentary logical framework. 	

- Timeliness and completeness of reporting on project implementation
- There are no reporting available from the buyer, but both the contractor and the monitoring consultant (SWECO) have regularly and mostly timely reported on progress and lack thereof, although the last available report is from 2019.

JC Rating:  Partly satisfactory. The quality is rudimentary but nevertheless the development logic is convincing. There should be more context specific analysis


JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio


There is a logical framework, with indicators, but many are not quantified and there is very limited reporting on progress on the logframe. Also part of the log-frame is copied from the Ha Gaing appraisal (including the name and wrong numbers), further undermining the integrity of the appraisal

The development objective is to 'Improve urban environmental conditions in a sustainable manner through the construction drainage and sewerage networks and wastewater treatment plant, and improvements in urban environmental sanitation facilities.' This, in turn, is supposed to 'improve quality of living condition of resident in the Ha Giang Town' (sic! It is copied from the Ha Giang, but should have been Ba Don) by minimizing environmental pollution and diseases caused by waste water and lack of environmental sanitation facilities.

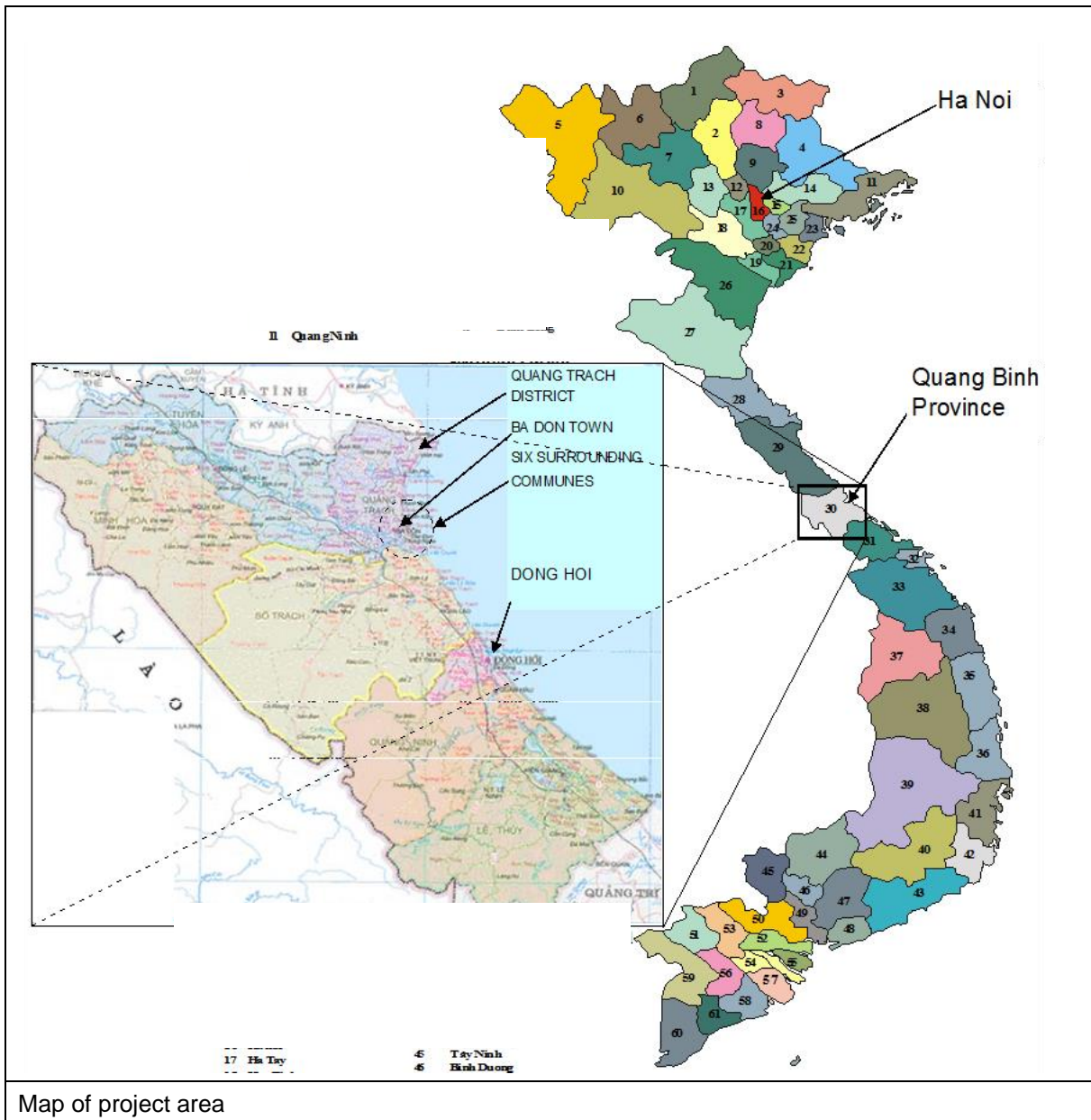
The progress reports from the contractor and the monitoring reports are mainly concern with physical quantities delivered, budgets and as time goes by, with solving the dispute between the contractor and the buyer.

There are references to other SUEZ managed, DSIF financed projects which are used as examples of how projects can be successfully implementation. The DSIF project director responsible for the Vietnam portfolio is using the Ba Don project as a lesson in navigating the centralised political environment in which the authority of local management is limited.

JC Rating –  Unsatisfactory, the result framework is too generic, flawed and partly copied from another project, rendering it of limited usability. It should arguably not have been approved by DSIF / Danida.

EQ 11 Overall Rating:  Partly satisfactory, The logframe developed at appraisal had many unquantified indicators and subsequent monitoring did not attempt to rectify this, nor monitor around it. Moreover, there is extensive copying from other projects including basically wrong figures inserted from these other projects. Such low level of standards should not have been accepted by DSIF / Danida. However the fundamental development logic and theory of change is convincing and evidenced in other similar projects.

Images



GRAVITY PIPELINE trench excavation and piping work



SLUDGE TANK/DEWATERING HOUSE under construction



17 Vietnam: Ha Giang Town Drainage & Waste Water Treatment

Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> Reasonable implementation progress with design and engineering works for the WWTP completed. Appraisal claimed that 3.000 households would be connected, but it was subsequently reduced to 1.500 and length of pipelines also reduced. PMU and local authorities find quality satisfactory including the Danish equipment (pumps) Users are looking forward to better sanitary standards 	

Summary						
Project name	Ha Giang Town Drainage & Waste Water Treatment Project					
Type of project	Surface and wastewater drainage networks construction and, wastewater treatment plant					
Project No.	104.O.30.Vietnam.MOF.21					
Description	<p>The project development objective is to improve urban environmental conditions in a sustainable manner through the construction wastewater treatment plant, sewerage and drainage networks, and improvements in urban environmental sanitation facilities.</p> <p>The project comprises:</p> <ul style="list-style-type: none"> Separate surface and wastewater drainage networks serving the core area of Ha Giang Town; 3.000 m³ per day capacity wastewater treatment plant; and Supporting environmental sanitation facilities. Institutional and capacity development of operator of infrastructure to be constructed The Project's development objectives are monitored according to the following indicators: <ul style="list-style-type: none"> Number of persons benefiting from reduced incidence of flooding Planned 3.013 households connected to the sewerage network. Field visit found that only 1.500 households are connected to the system. Number of persons with access to improved public toilets Proportion of service provider costs recovered from beneficiaries. 					
Sector	Water, drainage and sanitation					
Country	Vietnam					
Sponsor	Danida and MoF, Vietnam					
Other stakeholders	Provincial People's Committee, District People's Committee, PMU, Ministry of Planning & Investment.					
Clearance in principle	Probably in 2016, no info available					
Approval/Binding Commitment	2009	Loan / Investment Agreement Date			Letter from Nordea to MoF Nov. 2016	
Danish Bank	Nordea					
Loan Duration + Grace Period	Start date for loan 2010 10 years, no grace , extended for 1 year due to covid19					
Project Amount and funding plan	Total contract DKK 72,2m Danish contract DKK 62,3m, rest from borrower					
Danish Exporter	SUEZ A/S					
MFA guarantee	Date	2017	Amount	€ 5.8m	Duration	10 years
Implementation status	Completed 99% of the construction, waiting for the contractor's experts to test operation and handover					

Summary	
Feasibility study details	Feasibility from 2008 and several studies in this connection: Socio econ survey, willingness to connect, geological surveys, EIA and, basic design report
Subsidy – rationale and key features	From the project document: 'The financial analysis shows that very high wastewater rates will be needed for to make the project commercially viable. Based on international experience, it is recommended that the tariff is not set higher than 3% of the minimum income. It is thus estimated that an incipient wastewater tax of DKK 0,64/m ³ will be sufficient to cover the project's operating costs. The conclusion is therefore that the project is not viable under commercial conditions, but that the project under mixed credit conditions will be profitable. The socio-economic benefit of the investment is difficult to value accurately. However, it is considered to be significant when the positive effects associated with the project are taken into account. The direct benefits include an improvement in the state of health and the standard of living in general in the project area. In addition, there are the indirect benefits related to the development of local business and thereby local job creation.'
Country Context	<p>High economic and population growth (the latter around 1,3% annually in Ha Giang Town) has led to increasing environmental challenges as many areas are facing difficulties in proper development of infrastructure to sustain the increasing industry and population. All indications are that this will put additional pressure on the need for waste management and water treatment. The urban districts in the provinces are especially faced with difficulties in securing financing for the necessary rehabilitation and extension of the infrastructure, replacement of outdated equipment and other needed initiatives.</p> <p>Denmark has a long history of supporting water and sanitation in Vietnam going back to the 1990s. This was primarily grant funding (over DKK 1bn) firstly focused mainly on urban areas, from 2.000 onwards also including rural ones. It primarily took the form of sector budget support to the government, pooled with other donors (AusAID, DfID, WB and the Netherlands) that also included engagement at policy level aimed at making the financial and regulatory framework more conducive and sustainable, e.g. through raising water fees.</p> <p>Ha Giang wastewater and drainage project supports the Vietnam national development strategy "Orientation Plan for Urban Drainage to 2025 and vision to 2050" that aims for treatment of 70-80 per cent of household wastewater in 2025 and full treatment in 2050. Vietnam has adopted a national strategy that includes standards for industrial discharge of wastewater. Denmark supports the national water and environmental strategies with the Water and Sanitation Sector Programme from and the Environmental Sector Programme and the project will contribute to these efforts. Ha Giang is the provincial capital with a population of 43.000 at the time of appraisal (2009), 25.000 of which would gain access to project services .</p>

Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The project is aligned to the objective of poverty reduction through providing access to safe water and standardized wastewater treatment systems. The appraisal states the project will contribute to 'reduction of poverty by allowing population to access public services with abundant environmental health benefits' (p. 29). This was fully in line with both Danida's global policies as well as the Danida country strategy at that time which has the water and sanitation sector as a key priority, both for the grant programme and for DSIF.¹³⁹ In the country strategy there it was stated 'The emphasis in the Danish supported programme will be on poverty targeting, national ownership, sector wide approaches and long-term sustainability. Accordingly, the</p>	


¹³⁹ Danida: Strategy for Danish Bilateral Development Cooperation with Vietnam, 2000; Danida: Strategy for Development Cooperation 2006-2010- Vietnam, 2010a and Danida: Water supply and sanitation ,

programme will be implemented through the Vietnamese partner systems.¹⁴⁰ The country strategy also stated that DSIF should 'broaden the sectoral coverage of mixed credits. Public health and vocational training are among the potential new areas of support. There will also be emphasis on increasing the interest of the business sector in these soft loans.'¹⁴¹ While the Ha Gaing did not deliver on the broadening ambitions, other DSIF project did.

However there is no real explicit explanation of the causal drivers between the improved sanitation and poverty reductions (e.g. that poorer households would benefit), but this is implicitly assumed. However these causal links are generally well documented globally.¹⁴² The reason for lack of detailed and context specific analysis may be due to the consultant (PEM Consult) copy-pasting the following sections from other Vietnam projects of coherence arguing that the project:

- Was consistent within the Danida aim to reduce poverty.
- Contributed to improving living conditions of all, particularly the poor, with significant economic and environmental health benefits.
- Was environmentally sound.
- Was well aligned with government plans and strategies.
- Adopted appropriate technology choices, which should be technically sustainable.
- Was not commercially viable and hence complies with the OECD guidance.

While the analysis is sloppy, the project nevertheless also aligned to DSIF policies.


JC Rating -  Partly Satisfactory, but the analysis is somewhat superficial and could be more context specific (e.g. how many are poor in the areas serve).

JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account

The project is clearly aligned with the then ruling policies and strategies both at national and provincial level. This included the Poverty Reduction and Growth Strategy and the five-year Socio-Economic Development Plan 2006-2010, the associated National Target Programme as well as the National Strategy for Water Supply and Sanitation (GoV, 2000). Indeed it was the provincial government that commissioned the feasibility study and did the basic designs. Thus the project contributed to the sanitation and environmental goals of Vietnam that called for suitable drainage and sewerage systems in all urban areas by 2020.¹⁴³

The AR is based on the feasibility and basic design documents which were commissioned by the local authorities. Moreover the AR mentions that it held fruitful discussions with the authorities in Ha Giang Province and Town, and the Project consultants responsible for the feasibility study.

The GoV signed the loan agreement and hence formally confirmed its alignment. In practice it also seems closely aligned to the national policies and strategies, being formulated by local authorities and vetoed by central ones.

JC Rating -  Satisfactory, the process has been led and owned by local authorities and approved by central ones. It is clearly aligned to national level policies and strategies although the degree of in-depth consultations and detailed context-specific analysis by especially the appraisal is somewhat unclear, partly due to re-use of analyses from other appraisal reports (e.g. Ba Don)

JC 1.3 Added value of Project Preparation Facility (PPF)

Feasibility study prepared by client was of acceptable quality.

JC Rating - NA

JC 1.4 Complementarity with development partners operations and strategies

The core donors to the sector, include the World Bank, Australia and UK. Under the rural water supply and sanitation programme (from 2012 to 2018) the World Bank provided an IDA concessional credit of USD 200m (info on previous support not available). The ADB has also provided support to the sector but mainly urban water supply and sanitation, in the form of concessional finance of close to USD 1bn.

The grant support to sector has generally been praised for improving access substantially and with a strong pro-poor focus although sustainability has posed challenges. Moreover other substantial development partners have also noticed the work at policy level and its impact with e.g., ADB noticing the important work by Danida to reduce non-revenue water in the sector.

In the case of Ha Giang, there is only an indirect reference to other donors in relation to M&E where it is argued that 'to meet requirement of Donor and Government on monitoring & evaluation and reporting procedure for ODA projects/Program in Vietnam (refer to Decree 131/ND- CP/2006), a Monitoring and Evaluation system need to be set up right beginning of the project in order to ensure achievement of set objectives and outcomes.' Otherwise there is no mention of other development partners.


Danida sector policies, 2000. See also paper on 'Background and context to the Vietnamese DSIF case studies in water and sanitation' Particip 2021.

¹⁴⁰ Danida: Strategy for Development Cooperation 2006-2010- Vietnam, p. 30.

¹⁴¹ Ibid. p.38

¹⁴² See e.g. Bosch, Christophe, et al. "Water, sanitation and poverty." Draft chapter. Washington DC: World Bank (2001).

¹⁴³ See GoV: National Orientation for the Development of Urban Sewerage and Drainage until 2020 (Hanoi 1999)


JC Rating -  Satisfactory: There is no mention of other development partners but both the documentary reviews, interviews with Danish stakeholders and field visits confirmed that no other donors were duplicating the work of DSIF in Ha Giang. Clearly, there is no need to coordinate if DSIF is the only project, although there could be arguments for more explicit complementarity in terms of WatSan policies and regulatory framework, with both ADB and WB having substantial support to this sector across Vietnam. This kind of complementarity was more implicit.


JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

The basic design documentation is based on good criteria aligned both to national criteria and priorities as well as local criteria that pushed for better urban sanitation. In DISF's analysis, there are four core developmental impacts mentioned in the AR:

9. Number of persons benefiting from reduced incidence of flooding
10. 6.500 (or in other places 3.013) households with connections to the sewerage network
11. Number of persons with access to improved solid waste disposal
12. Proportion of service provider costs recovered from beneficiaries.

These core development outcomes are again copy-pasted from another AR (Ba Don) right down to insert the wrong number (6.500) of benefitting households. Again this clearly indicate a shallow analysis of the development impacts and limited priority attached to evidencing the real impact accurately, nor to targeting the intervention as to maximise it.

JC Rating -  Partly satisfactory: The project was initially identified by Vietnamese authorities at both local and central level, with reasonable justification both in terms of complying with national criteria and local priorities. These clearly analysed the development outcomes and identified pathways to achieve these. However even if the project thus plausibly contributes to sound development outcomes, the DSIF analysis underpinning this is sloppy and plagiarised, and the indicative results framework is also very weak and not contextualised. Given the lack of attention in the appraisal phase, there has arguably been limited pressure from DSIF side to monitor and report upon developmental aspects.

EQ 1 Overall Rating –  Partly satisfactory: The project is clearly well aligned with a host of policies including those at national, provincial, Danida and DSIF level. It is less documented if and how it complements other development partners engagements. The appraisal assessment of potential developmental outcomes was not credible and lacks in contextualised evidencing.


EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
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JC 2.1 Systematic research for coherence with MFA development policies and strategy




There are only few reference to Danida policies and strategies, but overall it is coherent with them reasonably well on e.g. environmental and sustainability issues. The Danida Strategy Partnership 2000 (published in 2000 and valid till 2013) had strong poverty focus. The Danida strategy for development cooperation 2006-2010 with Vietnam, had a strong focus on environment, as did the overall Danida strategy where it was argued that Danida would 'strengthen the capacity of the developing countries to show the necessary concern for the environment. The use and administration of natural resources by the present generation must not take place at the expense of future generations.'¹⁴⁴ It further highlights the need to ensure equal access to water.


The analysis and underlying in the appraisal is not particularly thorough, as it just states that better sanitation will drive improved health outcomes as well as improving the environment. However this is fundamentally correct and thus also sufficient. The project was thus clearly in line with DSIF strategy at that point in time (e.g. on types of investment, country preferences and sector choice) and also the MFA policies

There is generally no explicit reference to MFA policies and strategies in the monitoring reports, but generally the project is till coherent therewith and hence with limited need for specific coherence-corrective efforts.

JC Rating -  Satisfactory, the project is clearly coherent with both Vietnamese and Danish development policies and strategies.

¹⁴⁴ Danida: *Partnership 2000*



JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p>There is strong compatibility with this project and the objectives of Danida in terms of improving living standards, especially for the poorest. There was supposed to be synergy between this project and other DSIF project in Vietnam also implemented by Suez, but there is limited evidence of that materialising. Also there has been limited learning from other engagement at e.g. policy level.</p> <p>The embassy has been active in coordination and exchange of information with both government and other development partners. Denmark has attempted to align its assistance with those of Vietnam at various levels. Nevertheless, there is no evidence that the project was part of such efforts as it was mainly localised and handled by the contractor and local authorities. The contractor, Suez, has assisted in conflict resolution, which according to Suez is not a Vietnamese core competence.¹⁴⁵ As a consequence the number of claims and variations is comparatively low.¹⁴⁶</p> <p>JC Rating -  Satisfactory, most synergies and complementarities evident at the local level and indications are that the project has engaged with local authorities as confirmed by field visit. The Danish embassy is kept informed on implementation progress, thorough meetings and quarterly updates.</p>	
JC 2.3 Danish business links with beneficiary countries	
<p>The evaluation team found that Grundfos pumps and AVK valves from Denmark have been used for the project. However, the degree to which the contractor Suez can be considered a bona fide Danish company is debatable. Its Danish subsidiary is small and most of the turnover seems to stem from DSIF financing, suggesting the office, at least in part, has been established to allow for bidding for DSIF projects. In addition, there are indications that Suez attempted to use expensive French designs for simple construction, instead of sourcing such locally.¹⁴⁷</p> <p>JC Rating -  Partly satisfactory, as also argued in the case of Ba Don, there seems to be limited links to Danish inputs although some pumps and valves were used. However, how Danish the contractor Suez is given it has limited presence in and links to Denmark.</p>	
EQ 2 Overall Rating –  Partly satisfactory Few explicit synergies have been identified but the project was aligned to and coherent with both Danish and Vietnamese policies and strategies. Of concern are the limited links to the wider Danish business community as a result of the project and other Suez projects.	



EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>The appraisal report justified the DSIF subsidies as cost-recovery waste-water fees would be prohibitively high. There is no comparison with alternative sources of finance, but clearly the high concessionally is attractive against most commercial alternatives, even if tied to a nominally Danish contractor. Financial additionality was limited to the subsidised loan and grants. No commercial or development banks provided funding.</p> <p>JC Rating -  Satisfactory, the project probably would not have been financed without subsidies this seems necessary and warranted given the strong externalities associated with better sanitation.</p>	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
<p>There is strong focus on the environmental benefits in the appraisal report and also plans for following up with training on environmental protection, waste collection and sanitation, gender disaggregated. However, the training is reportedly delayed due to Covid 19 and the content of the planned training is not known (e.g. if it includes environmental protection).</p> <p>Concerning occupational health and safety, the appraisal states (copied word-by-word from the Ba Don appraisal) that OHS are new concerns currently receiving insufficient attention, also in the feasibility study. On corporate governance there is a recommendation to ensure that the Water and Sanitation Company receive specialized capacity development assistance for turning around its current operating and financial performance. It is unclear if that has been implemented as the quarterly reports from Suez focus on physical progress and contractual issues.</p> <p>Clearly the enhanced focus on ESG would not have been present without DSIF involvement, but the degree to which this translated into better ESG practices during the implementation is still unknown as the quarterly reports don't report on this. Third party monitoring reports by NIRAS are mostly focus on progress and obstacles hereto, but work safety is occasionally mentioned, consistently in positive terms, with Suez being lauded consistent use of helmets, safety shoes and yellow vests, contributing to a zero accidents workplace. This was also confirmed during the field phase.</p>	





¹⁴⁵ Interview, 25 March 2021.



¹⁴⁶ Interview with Monitoring consultant 6 April 2021

¹⁴⁷ Niras: Ha Giang, Project Update, November 2019

<p>There is no evidence that the ‘Crown and Flag’ played any significant role, but clearly Denmark was well-known in the water and sanitation sector which may have instilled some confidence in the Vietnamese authorities. Moreover, Suez is arguably not seen as a Danish company.</p> <p>JC Rating -  Satisfactory, as there is focus on the pre-implementation phase, as well as during the implementation.</p>
<p>JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding</p>
<p>No commercial funding was mobilised JC Rating – N/A</p>
<p>EQ 5 Overall Rating –  Satisfactory, The project was clearly not commercially viable and should deliver significant environmental and health benefits. Financial additionality was limited to the subsidised loan and grants. On ESG, incl OHS there is some focus in the pre-implementation phase and PMU and Suez confirm the focus has been maintained in implementation.</p>

<p>EQ 6 - Effectiveness</p>	<p>What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?</p>
<p>JC 6.1 Satisfactory implementation of infrastructure projects</p>	
<p>The project is 99% completed but covid 19 has delayed handover and start of operation. 1.500 HH connected 3.000 m3/day against an original target of 3.000, but these are now fully connected. Physical inspection by the evaluation team revealed high quality, including the use of Danish equipment and widespread user satisfaction. PMU was also appreciated the quality but complained about the long lead time with feasibility done in 2008 but implementation only finalising now.</p> <p>JC Rating -  Satisfactory as the project is likely to bring the expected benefits soon, and with good quality. While the length of the pipe network and the number of connections has been reduced, eventually these targets may nevertheless be met.</p>	
<p>JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)</p>	
<p>As regards contribution to enhanced economic growth this is expected but not quantified nor detailed. The AR argues that the project contributes to improving living conditions of all, particularly the poor, with significant economic and environmental health benefits. However no attempts are made to quantify the number or the share of poor among the beneficiaries.</p> <p>Some temporary employment was created during construction. Subsequently the appraisal report projects ‘moderate social impacts due to employment opportunities created’ due to the better infrastructure and more business opportunities offered.</p> <p>The field trip to the site probed into the dry test run which was characterised by all partners as successful and future beneficiaries are clearly having expectations of improved sanitation, water and air quality. However, the number of households has been halved, so on that account the project will not immediately deliver the expected outcomes to planned number of beneficiaries. However, the local authorities are likely to expand the number of household connections over time, as has also been seen in other projects.</p> <p>JC Rating -  Satisfactory as the project is likely to bring the expected benefits soon, but without quantifying the impact on the poor. Moreover while the number of benefitting households has been reduced, eventually this target is likely to be met.</p>	
<p>JC 6.3 Environmental, social and governance (ESG) risk management</p>	
<p>AR has no mention of international best practices, but the project intended to comply with all relevant national laws and regulation as well as support the national objectives in the sanitation sector. The degree to which this has actually happened is not documented in the available reports, but there is no indication of contravening such practices. The risk assessment mainly focused on the environment, with almost no mention of governance and social risk. OHS is mentioned but not analysed.</p> <p>The feasibility study contained an EIA, which provided detailed information on expect impacts both positive (most) and negative (few during implementation).</p> <p>Clear measures for mitigating negative environmental impacts were outlined in the EIA for all phases of the project including for the operation period. The EIA also committed the project owner to a number of environmental protection measures on air and water quality. There is no available information on monitoring of the compliance to these commitments, apart from workers’ safety.</p> <p>Gender issues are discussed in the feasibility report where it is tantalisingly stated that ‘the project is considered to have great influence in sex functions as women have greater role in activities relating to water and hygiene.’ (p. 159). It goes on to detail how women benefits from reduced time to cleaning and general sanitation, as they are usually responsible for this. Also women typically have to attend to sick family members, but with better sanitation health should improve again benefitting women in particular. With more time at hand, women will also be able to engage in income-earning activities strengthening their fiscal agency. Finally the local branch of the women union may become active in the management of the sanitation services. The appraisal report summarily repeats some of these issues (in better English) and includes gender issues in the results framework where an indicators is stated as ‘No. of Women trained on environment protection, waste</p>	

<p>collection and sanitation' However it is not possible to check how gender issues have been mainstreamed in the actual implementation and training.</p> <p>During the field study and with interviews with project managers and monitoring consultants there was a clear picture emerging of the project having high environmental and workers safety standards, significantly higher than would have been the case had a local contractor been sole responsible.¹⁴⁸ Gender issues were generally not high on the agenda.</p> <p>JC Rating -  Satisfactory. The feasibility phase clearly had focus on EIA and ESG issues, the appraisal had more limited focus on ESG issues and the gender mainstreaming seems somewhat superficial. However implementation clearly had robust emphasis on especially environmental and workers' safety issues, acting as a role model for other contractors in the areas.</p>
<p>JC 6.4 Contribution to climate change mitigation, green and inclusive development</p>
<p>There is no mention of climate impacts in AR , but clearly the project has environmental benefits as well as improving flood control. Women, including poor women, will have more opportunities to engage in productive and income generating activities due to better sanitation and health. However these benefits are not quantified.</p> <p>JC Rating –  Satisfactory. There is a strong upside potential to improve the environment as the project will clean rivers, reducing the risks of flooding and water borne diseases. Moreover, it will also free up time especially for the poor that they can invest in productive activities.</p>
<p>JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth</p>
<p>The project is not likely to reduce carbon emission, but the additional emission in terms of e.g. electricity for running the treatment plan is minor and in the future. However there may be options to extract biogas from the sewerage sludge which would reduce emissions considerably. In terms of climate resilience, the overall project, including the sewerage and drainage network, will enhance climate resilience by offering better flood protection and improved disposal of waste and flood water.</p> <p>JC Rating -  Satisfactory.</p>
<p>EQ 6 Overall Rating:  Satisfactory. Clearly basic sanitation and better protection against floods have a high potential developmental benefits in terms of increasing living standards and strengthening resilience against climate change. The benefits could arguably have been better evidenced and disaggregated according to socio-economic groups and gender, but are nevertheless obvious, once construction is completed.</p>

<p>EQ 7 Commercial /developmental balance</p>	<p>Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?</p>
<p>JC 7.1 Satisfactory development outcomes(using DAC definition of impact)</p>	
<p>Indications from the field visit are that there will be significant health impacts and productivity impacts for especially the poorer sections of Ha Gaing citizen. Since the wastewater is connected to a separate sewer system, the bad smell in the manholes in front of the houses has already been eliminated for early beneficiaries.</p> <p>The development policy objectives are clearly being followed, if not fully documented. Thus there is an appropriate trade-off between development policy and financial prudence. The number of beneficiaries connected is lower than expected, but local authorities are likely to upscale the project later on and hence the core development outcome of better sanitation and health is likely to materialise, as also suggested in interviews with at the site. Moreover these benefits will, in all likelihood, be sustainable as there is strong local and central commitment to maintain the treatment plant and the associated network of pipes and pumps.</p> <p>JC Rating -  Satisfactory – The project will in all likelihood achieve the developmental outcome, even if some of them will be delayed. Strong local and national commitment is clearly key, but also robust construction quality and attention to environmental concerns by the contractor and monitoring consultant has helped achieve this benign outcome.</p>	
<p>JC 7.2 Strong ESG performance of DSIF projects</p>	
<p>There has been limited emphasis in the AR and FS on ex-ante ESG issues and no ex-post data as project is not fully operational yet. However as part of the feasibility study an EIA was prepared which went into great details on environmental issues as well as proposing mitigation measures, which have been delivered on in the implementation. The feasibility phase also included a socio-economic survey as well as a willingness to pay analysis. However, there has been limited focus on governance issues with neither the feasibility nor the appraisal investing substantial analytical resources in that aspect.</p> <p>JC Rating -  Partly satisfactory as more information may emerge when the project becomes operational.</p>	
<p>JC 7.3 Satisfactory financial returns and portfolio performance</p>	

¹⁴⁸ Interview with monitoring consultant 6 April 2021 and the Suez project manager in Vietnam 20 April 2021.

The plant is not operational yet and hence no returns, but the tariff regime is likely to be subsidized by government which implies negative financial rate of return. The DSIF subsidy has been needed to allow the project to take off and make the subsidy more acceptable to the authorities.

JC Rating - ● Partly satisfactory so far, but still remains to be seen post-implementation.

EQ 7 Overall Rating ● Satisfactory. Once the project starts producing the development outcomes as intended, the project will contribute to raising living standards and increased resilience, also benefitting many poorer households and women. There is a high probability that the benefits will be extended to more beneficiaries over time as the local authorities have strong commitment to the project and its eventual expansion. However, the commercial outcomes in terms of benefiting Danish exporters and giving them a foothold in Vietnam has been limited given that Suez's operations in Denmark.

EQ 8 Sustainability Have DSIF projects been economically, socially and environmentally sustainable?

JC 8.1 Level of economic viability

There is a clear increase in the coverage of sanitation services and better related infrastructure. The field visit found that over 1.500 households (reduced from Appraisal) now have connections in front of their houses, but there is high probability that this number will eventually be increased to the original target and possibly beyond as there is a strong drive in Vietnam for improving sanitary standards, not least by improve waste water treatment.

The economic rate of return has not been recalculated In the appraisal report it is assumed it to be higher than 15%.

The infrastructure is clearly being updated and all indications also point to the local authorities being willing and able to maintain it post-project ensuring continued access.

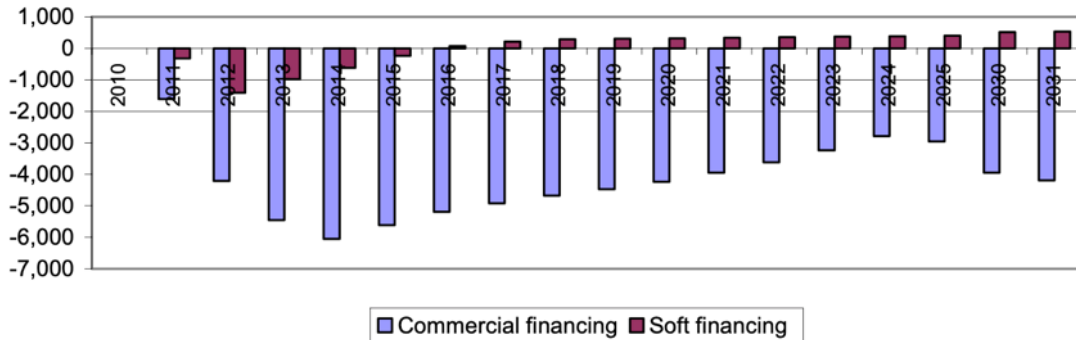
Concerning the availability/reliability of infrastructure the project is not completed yet so still no evidence, but indications from the field visit suggest that it was built with very high quality¹⁴⁹. (e.g. no quality complaints from buyer)

Finally concerning health outcomes, it is also too early to have an impact, but at least until now, the end-users have finally reported that the bad smell of sewage in front of their house has been significantly reduced compared to before the construction of the project. Air quality has thus improved.

JC Rating - ● Satisfactory, there is a clear upgrade of the infrastructure which in all likelihood will translate into better sanitation and health standards. Air quality as already improved. These outcomes are judged to be sustainable, as there is strong commitment among local authorities, who also have the technical capacity to deliver on this commitment and possibly extend those benefits.

JC 8.2 Level of commercial/financial viability of infrastructure

Cash flow profile, Ha Giang Project (VND million)









As can be seen from the above figure in the AR x, the FIRR for commercial financing conditions is negative, and the NPV when using a 6% rate of discount is VND -62.255 million. The FIRR for soft financing conditions is 8% and its NPV is VND 1.081 million when using a 6% rate of discount. These results clearly indicate that the project would not be commercially viable without DSIF support.

It should be noted that some of the assumptions (e.g. number of connected households) from the appraisal are no longer valid.

While there was no data available to update the cash flow calculations, the field visit found that central and local authorities indicate that tariff issues are still being debated both locally and at national level and not settled yet, as it is intertwined with the ongoing privatisation of waste water treatment. The overall direction of ensuring financial viability is clear, but the timing and modalities of how to get there is still being discussed.


¹⁴⁹ Based on visit to project site on 22 and 23 April 2021, which included inspection of plant and network.

JC Rating -  Partly Satisfactory – The original figures are no longer valid and should arguably have been updated following the reduced scope of the project. In itself the reduction in scope clearly undermine the financial viability of the project. However, based on both indications for local authorities as well as experiences from other projects, the outreach will likely reach the intended beneficiaries in which case the financial viability will improve, albeit with significant delays and loss of income in the meantime.
JC 8.3 Level of improvements in ESG achievement
Clearly there will be lower pollution and social benefits from those connected, which may help women in particular. However most of these are still to materialise, but already a sub-set of users connected report better air quality. the field visit found that local authorities, the contractor and coming end-users are confident that there will be both socio-economic benefits as well as clear environmental benefits.
JC Rating –  Potentially satisfactory, with early improvements already materialising.
EQ 8 Overall Rating  Satisfactory, the project seems be economically, environmentally and socially sustainable and also has strong political backing, and is thus overall likely to be sustainable. In addition if the network is further expanded

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
JC 10.1 Quality of risk management systems and policies on long-term sustainability	<p>The AR has a section on the main assumptions and risk related to the connection programme (e.g. supposed beneficiaries not signing up to the connection), capacity utilisation, funding for subsidies, construction risks, O&M risk and, the sustainability of the WATSAN company.</p> <p>As concern the project implementation risk, the AR apparently failed to foresee the need to downscale the number of connections and that could also lead to problems of capacity utilisation (although the number of pumping stations was also reduced from 4 to 3 as was the length of the piping system). The degree to which these reductions in project scope will make the above mentioned risk materialise is not clear from the documentation obtained.</p> <p>It would seem that the is an appropriate trade-off between development policy and financial prudence but ultimately this will only be clear once operation and incomes has been up and running for a number of years.</p> <p>JC Rating –  Partly satisfactory. The AR did not analyse properly the budget and scope of the project, as it was reduced considerably, post-tender. Other risks were managed prudently.</p>
JC 10.3 Quality of environment, social and governance (ESG) risk management	<p>The project will contribute to green and inclusive development and the risks associated herewith have generally been handled reasonably well, expect for the significant downscaling of the scope of the project which will obviously also reduce the environmental benefits and lower social inclusion. This risk could perhaps have been anticipated at appraisal.</p> <p>Suez seems to have ESG risks reasonably well under control, although there is limited explicit discussion in the quarterly reports. Field visits confirm robust focus on both the environment and socio-economic benefits that the project will catalyse and possibly also extend.</p> <p>JC Rating –  Partly satisfactory – Overall clear environmental and social inclusion benefits and the risks of jeopardising these during implementation and post-implementation seems well-managed. However the risk of inadequate budget at AR stage was underestimated leading to a reduction of project scope and consequently also of the ESG benefits. Eventually, these may materialise.</p>
EQ 10 Overall Rating:	 Partly satisfactory, the most significant risk that materialised related to too optimistic assumptions regarding the scope of the project that could be achieved within the budget. With that not materialising the scope was significantly reduced which in turn increases other risks, such as lower cost-recovery levels.

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	The development logic is that better sanitation will drive improved health outcomes including for the poor. At its most basic this seems leasable. However there is very limited context specific analysis nor any more detailed information on how to optimise the investment as to serve poorer segments. Again this may also be due to extensive copy-pasting from the Ba Don appraisal report.

Quarterly reports are provided by Suez, in a timely fashion but relate only to implementation. The project is almost complete in terms of technical and physical progress.


JC Rating –  Partly satisfactory. The development logic is sound but insufficiently assessed, especially with regard to identifying beneficiary groups and estimating the likely impacts on them.


JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio

The M&E system proposed in the AR is a mostly copied from the Ba Don project (also drafted by PEM consultants) with the consequence that the project specific indicators are often incorrect. The M&E is also too generic and does not quantify the indicators (e.g. just '% of people get diseases caused by waste water and environment pollution' without given any numbers of timeframe).

As also the case in Ba Don, the development objective is to 'Improve urban environmental conditions in a sustainable manner through the construction drainage and sewerage networks and wastewater treatment plant, and improvements in urban environmental sanitation facilities.' The progress reports are focused on physical progress and do not discuss e.g. the degree to which the development objectives have been compromised by the significantly reduced scope of the project.

There is limited evidence on feedback and application of lessons learned in previous projects and wider portfolio management but more information will be solicited in the field phase

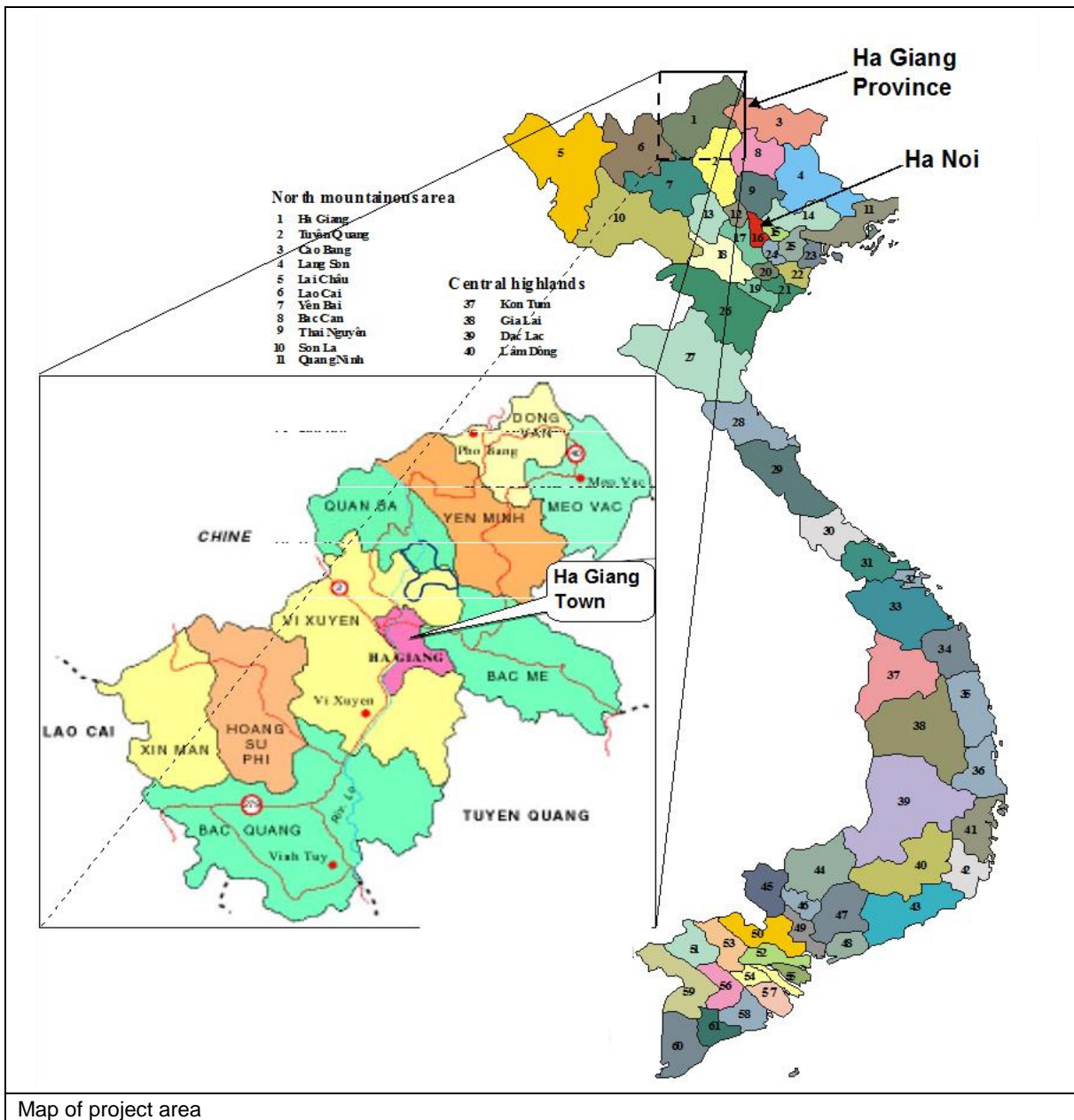
JC Rating –  Not satisfactory, the result framework is too generic, flawed and partly copied from another project, rendering it of limited usability. Insufficient attention was given to the project specific intervention logic

EQ 11 Overall Rating:  Not satisfactory, the basic results framework, including M&E and indicators, is too rudimentary, generic and outright flawed. Against this background it is not surprising that the subsequent monitoring has been narrowly focused on inputs, activities and outputs.

Field visits and calls

17.1.1 Key findings

Completed 99% construction and waiting for constructor's experts to test operation and hand over, delayed due to covid19. The scope significantly reduced as compared to tender material, which could undermine impact and the economic and financial analysis. There have been issues around the contractor, Suez, attempting to use French designs for what could have been sourced domestically in Vietnam at a lower cost. However physical inspection revealed overall good quality of construction, with both the buyer and users satisfied and with robust environmental benefits.





April 2021 Field Visit Project Photographs



Wastewater treatment plant, April 2021

17.1.2 Virtual meetings by Skype and Teams

- Michael Brahe, Suez A/S Director 25 March 2021
- John Sørensen, Niras, Monitoring consultant, 6 April 2021
- Thomas Nguyen Van Nhan, Suez Project Manager of Ha Gaing, 20 April 2021.

17.1.3 Field report 21-23 April 2021

17.1.3.1 DAY 1 – 21 APRIL 2021

- Travelled from Hanoi to Ha Giang by bus, started at 17:30 and arrived at 24:00.
- stayed at the Yellow Stone Hotel

17.1.3.2 DAY 2 – 22 APRIL 2021

Site Visit, Meeting with PMU, Urban Management Division of Ha Giang City, Operator

- Introductory meeting with PMU director at PMU office at 9:00
- Visit WWTP from 10:30
- Meeting with PMU and Peter at 14:00
- Meeting with Urban management division of Ha Giang city at 16:30

17.1.3.3 DAY 3 – 23 APRIL 2021

Meeting with Users, Authorities, Network Visit

Meeting with users from 8:00

- Meeting with Minh Khai ward people's committee at 9:30
- Meeting with Ha Giang department for Planning and Investment at 11:00
- Visit sewer network at 14:00
- Travelled back to Hanoi, by bus, started at 17:30 and arrived at 24:00.

17.1.3.4 Findings

- Completed 99% construction but project not yet in operation due to COVID-19
- Reduced number of connections from 3.000 to 1.500, reduced pipe length, number of pumping station.
- There is Danish equipment
- Quality of construction look good
- Contractor organized training and send safety staff to the site.
- Extend time 1 year, from December 2020 to December 2021.
- Users satisfied with project, feel that environment has improved
- There will be a charge for wastewater as regulated by government law to have fund to O&M the project

17.1.4 Combined physical and skype interview with PMU Director, Mr. Khanh and FIDIC engineer, Mr. Tuan, Ha Gaing, 22 April 2021

17.1.4.1 Their role and time in project

FIDIC Engineer contracted to for 3 years so all project duration. Contracted by Danida. PMU director, Khanh, appointed by PPC has been in place since the start in January 2018. Scares re

17.1.4.2 Status of the wastewater plant (3.000 m3) and household connections (3.013?).

Need engineer from Denmark to test and commissioning. 99% is completed. Construction is in highest quality. Yes 3.000 m3 but only 1.500hh will be reached. Reduction of HHs due to budget constraints as budget was made in 2008 and then price escalation since. Delay due to limited competition from Denmark.

17.1.4.3 Danish/int'l added value of using Suez and DSIF:

Technology, practices: International company with wide experiences. Technology is innovative and better intellectual property they can access as engaging with international contractor

Lifetime cost of equipment/sustainable equipment

Yes, equipment comes from EU, but no clear opinion on quality as of yet, but seems reasonable also compared.

17.1.4.4 Worker's safety

This is specified in the contract and Suez complies. E.g. they organize training and send safety staff to the site.

17.1.4.5 DK equipment?

Pumps are from Denmark as are the vaults.

17.1.4.6 Sustainability, e.g. tariffs levels sufficient?

PMU not involved, but Vietnamese regulation usually ensures that the government's investments are maintained also in relation to protecting the environment. Connection is free, but there will be a charge for wastewater as regulated by government law.

17.1.4.7 Support from DK embassy, DSIF, monitoring consultant (Niras)

Appreciated the support from Denmark's government incl. the embassy in Hanoi, Cowi and Niras as well as GFA. All support has been appreciated. GFA was mostly about PR and communication with local people.

17.1.4.8 Poverty impact e.g. are the poor benefiting more or less than others?

Benefits all people, rivers will be cleaner and also the air quality will be better. Health of the people will also benefit with improved living standards. Wants to reach 3.000 households eventually.

17.1.4.9 What can we learn and do better?

Project management experience with Danida is useful for ODA project and other future projects. Difficult to say what can be improved as the framework is agreed with the two governments of Vietnam and Denmark. PMU has only followed the provisions given. However, they should be able to connect the last 1.500 households and Danida should consider doing this.

Mr. Peter Christensen concluded the meeting by congratulating Mr. Khanh for a successful implementation of the project that will bring benefits to the people and environment of Ha Gaing.

17.1.5 Interview with John Sørensen, Niras, Monitoring consultant on Ha Giang WWTP, 6 April 2021.

His role: Has been working with DSIF for 15 years in different kinds of jobs. Done appraisal work and tender docs for local PMUs. As well as ToR for feasibility.

Status of Ha Gaing (& Bac Gaing): Supposed to be finalized in October 2020 due to Covid. Missed the chance to draw money out of Nordea loan, but missed the deadline from PM of Vietnam. Has to reopen the loan but it will take longer time. MPI also involved. Middle of commissioning. Dry tested all equipment. Ha Giang has a good supervision engineer.

Appraisal & IERR unrealistic, any updates?

Too long period from FS/AR to tender, up to Danida to update.

Suez Dk company: No not a Danish company, but Grundfos is providing equipment. Providing high-quality. Competition is too limited in the sector.

17.1.5.1 OHS/ESG standards:

Yes, very high focus on this. Security manager on every site.

17.1.5.2 Sustainability:

E.g. Ba Don not doing much to raise awareness, but in Ha Gaing the PMU director organize public meetings on the benefits of connecting. Not familiar with the tariff structure but has agreement with other WWTP to outsource.

17.1.5.3 Development outcomes

Not involved in the monitoring hereof but the AR contained analysis. Buyers have been provided post-project information.

17.1.5.4 DK embassy / aid synergies?

DSIF has relation, but embassy has a group involved. Not observed the synergies.

17.1.5.5 Size of the project

In Ha Giang not many claims nor many variations. Project in Ba Don is at lower admin level (municipality) so less money and less competencies.

Vi Thanh: Also, the change from Nordea to Danske Bank cause at least one-year delay. Contract made by private water company, but this undermined validity of Danida loan, so it changed to PPC.

Training by GFA in technical issues and promotion of HH connections. PMUs also used GGA as consultants. Perhaps a bit premature as it was years before the WWTP was to be put in use. GFA also used for technical design comments, which was basically duplication of work as monitoring consultant did the same.

Use yellow book, has tried silver book FIDIC but contract price too high as a result.

17.1.6 Interview with Director, Michael Brahe, Suez A/S 25 March 2021

Vietnam is a challenge and all could have done better, but the project in Vietnam. Too long duration between feasibility and contract start so the budget was too low and even what was promised was not available. DSIF is a good tool for Vietnam also in helping finding projects. DSIF is also very slow not only Vietnamese authorities. Need higher proactiveness on DSIF side to identify projects.

Suez was out between 2010 to 2015 as Suez HQ decided to close DK office. But Danida encouraged them to come back. Too small projects in Vietnam need to go bigger.

Monitoring consultant of Danida was new for Ba Don with much higher engagement from the monitoring consultant. Really working hard in monthly meetings but too frequent changes in monitoring consultants -> losing memory which is needed. However esp. in Vietnam it is needed as a referee when local authorities want to change contract. Vietnamese PMU have very limited powers to change minor specifications -> delays. Draw down period on loan expired and investment budgets expired so need new approval. Again resulting in delays. This is the case for both Ha Giang and Ba Don. Nobody has really understood how these ODA projects really works in Vietnam. Not enough local money. The project wastewater is not really supported locally and people block the work of Suez because they are not willing to pay or connect.

For Ba Dong many meetings with Embassy and authorities, but no impact. The sustainability is not well secured as Danida gets out of the way once the contract is in place. Also no insurance of connections and O&M. DK not able to pressure on Vietnam. The financials should have been secured upfront. Sustainability is compromised when focus is on budget squeezing.

17.1.6.1 Danish added value?

Good question, right technology and expertise. Has appropriate technology for educational standards. Not leaving the clients behind and will fulfil contracts no matter how difficult it has been. Local authorities will not accept equipment out of China. Also gives a status. Few conflicts or French or local designs as it is detailed in specifications.

17.1.6.2 ESG standards (high in Ha Gaing)

Yes absolute OHS is a strong Suez focus. Daily fight with PMU and local authorities. Insist on subcontractors.

Ha Giang, WWTP: Start 2016, Benefitted from the German consultancy on institutional and community aspects. On track. Last update November 2020 Q3. Progressing reasonably well and close to complementation (early 2021). Scope significantly reduced (HH connections at appraisal: 6.500. De facto: 1.500, but now GoV/PPC commitment as HH connections are low tech and doable for locals) as compared to appraisal, which could undermine impact and the economic and financial analysis. The have been issues around the contractor, Suez, attempting to use French designs for what could have been sourced domestically in Vietnam at a lower cost.

Overall successful for all partners, Covid brought problems in accessing site. Need to have monitoring consultant to solve problems. Vietnamese not good at conflict resolutions. Good coop with DSIF and embassy. PMU forgot to apply for local budget for 2021 and draw down period expired and investment budget expired.



WWTP



WWTP



Chemical room



Underground pumping station



PMU



- Urban management division of Ha Giang city



Ha Giang department for Planning and Investment



Minh Khai ward people's committee

18 Vietnam: Lam Son - Soa Vang Water Supply


Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> Increased budget in 2012 and extension in 2017. Main outstanding issue is a leaking from the sludge drying facility. Most initial targets on outreach and capacity have been met and in that sense relatively successful. Lower than target household connected, but gradual roll-out planned. There is a new private water supply joint stock company, which is funded by water tariffs, which is still insufficient to cover costs. It is claimed in the appraisal that the poorest will see the biggest impact, and this has been achieved as the poorest can get cheap clean water. A second phase is planned, with both treatment plant expansion and more household connects. This will be privately finance by bank loans to the water company. Credible that this will ensure sustainability. The set-up seems sustainable with more household connections coming online bringing in additional tariff revenues. However some households are reluctant to abolish their wells as they deem the ground water quality acceptable. 	

Summary						
Project name	Lam Son - Sao Vang Water Supply Project					
Type of project	Drinking water provision					
Project No.	104.O.30.Vietnam					
Description	Provide clean piped drinking water. Construction of a water treatment plant, intake transmission and distribution pipes and a booster station. Covering two adjacent cities that are being merged.					
Sector	Water for human consumption. OECD DAC Code: 14021					
Country	Vietnam					
Sponsor	Danida, MoF, Thu Xuan District Peoples Committee (DPC),					
Other stakeholders						
Clearance in principle	NA					
Approval/Binding Commitment	7 March 2005	Loan / Investment Agreement Date			May 2013	
Danish Bank	Nordea					
Loan Duration + Grace Period	10 years					
Project Amount and funding plan	€7,8m in total incl. cash grant of €0,9m. 15% Pre-payment against an advance payment guarantee and a performance security covering an amount equal to 10% of the total contract amount and valid until the lapse of the defects notification period.75%in proportion to deliveries. 10%at taking-over against verified taking-over certificate.					
Danish Exporter	Krüger (now subsidiary of Veolia)					
MFA guarantee	Date	NA	Amount	95%	Duration	10 years
Implementation status	Completed in operation for one year.					
Feasibility study details	NA					
Subsidy – rationale and key features	The cash flow for the project was acceptable to DSIF. With the project's lifetime of 20 years, the present value was deemed positive, and the internal rate of return (FIRR) of 14 per cent. Cash flow was not expected to be positive until year 9, and the accumulated cash flow positive in year 14. The financial situation would thus be tight in the first years, as it could not be expected that all households will be able to connect immediately. It was therefore a condition that DPC confirms that there are sufficient funds to ensure the ongoing operation and maintenance of the project.					

Summary	
	<p>The socio-economic benefits of the investment were difficult to value accurately. The direct benefits included a reduction of waterborne diseases and thus an improvement of the health condition and standard of living in general in the project area, reduced costs for medicines, saved transport costs to fetch water and creation of jobs in connection with the construction of the plant. In addition, there are the indirect benefits related to better conditions for business and tourism, etc. These socio-economic benefits are likely to materialise as the water is high quality and comparatively cheap. Also, this may reduce cancer rates. The poorest are getting subsidies for connecting.</p> <p>The loan amount was EUR 7,8m which included an interest subsidy of EUR 1,5m, the bank margin was EUR 0,1m, the EKF premium was EUR 0,7m and finally a cash grant of EUR 0,9m. In total the Danida support was thus EUR 3,2 or about 37% of the contract amount.</p>
Country Context	<p>The neighbouring towns of Lam Son and Sao Vang have experienced very high economic growth exceeding that in the province and the whole country, mainly because of the growth of industrial activities in the area. At the time of appraisal (2004) the GDP growth rate was around 15% and the authorities expected it to stay at this high level. The average income level in the area was VND 10,3 million per household in 2003, compared to 7,45 million for the nation and more than 13 million in Hanoi.</p> <p>With high economic and population growth in the area, there was an urgent need to improve access to safe drinking water. At time of appraisal there was no piped infrastructure with water coming from individual shallow dug water wells of dubious quality and a few deep borehole wells. The shallow wells were next to the latrines in the dwellings, which polluted the well water and even the groundwater at neighbours.</p>

Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The AR does make a few references to Danida's then guiding principles for supporting water and sanitation and claims that it is consistent herewith.¹⁵⁰ It does also claims that the minimum DSIF criteria are that the project would have to be neutral or weak improvement poverty, positive or neutral cost benefit relation for the environment, and neutral or positive gender balance.¹⁵¹ The evaluation team would argue that the DSIF (and the mixed credit at that time) was under the overall law on development aid, which has poverty reduction as its overall objective (and hence it cannot be neutral on that point). However, the AR does state that while both poor and non-poor will benefit, there are only around 200 poor households in the project area (less than 5%) and there is no effort to target these. But the effect on the poor eventually reached will be higher (perhaps due to rich buying bottled water and having own systems). Nevertheless, the AR does assess the gender impact to positive (women are typically responsible for water collection) and it is estimated that piped drinking water could save women and children from 1 hour per day of labour. While there will be environmental issue with increased wastewater (e.g., from flushing toilets) the benefits are estimated to far outweigh the cost. This was fully in line with both Danida's global policies as well as the Danida country strategy at that time which has the water and sanitation sector as a key priority, both for the grant programme and for DSIF.¹⁵²</p> <p>As regards the DSIF eligibility criteria, the AR convincingly calculates that the project is not commercially viable and that there are sufficient qualified Danish contractors to have effective competition and appropriate solutions.</p> <p>JC Rating - -  – Satisfactory: The project was broadly coherent with both Danida and DSIF's policies although the poverty targeting non-existing but the gender analysis was convincing. The project also aligned well with the Danida country strategies of both 2000 and 2006, both of which had substantial focus on water and sanitation.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	

¹⁵⁰ These which were developed back in the 1990s and had a strong poverty reduction focus. The last version was published in 2000 See Danida: Water Supply and Sanitation, Copenhagen 2000,

¹⁵¹ CarlBro: 'Appraisal of Safe water supply to Lam Son and Sao Vang Urban Area' September 2004

¹⁵² Danida: Strategy for Danish Bilateral Development Cooperation with Vietnam, 2000 and Danida: Vietnam-Denmark Partnership 2006 – 2010.

The project design and feasibility studies were undertaken by the local authorities and the AR does also provide some assessment of the relevant national development policies and strategies. In particular, the feasibility is based on the National Strategy for Water Supply and Sanitation and the National Target Programme that was formulated in 2000, outlining an ambitious programme on expanding the proportion urban households with access to public piped water to 85% by 2020 (also aligned with the MDGs).

The AR asserts that the 'urban water sector policy is promoting the decentralisation of the investments in water infrastructures, which means the burden falls on the provinces or the districts (normally also via the province budgets). In the future, only few water supply investments will receive central funding from the government, and with the economic potential in Lam Son & Sao Vang, this will not be one of them.'¹⁵³ The AR had rather extensive consultation with relevant stakeholders at national, provincial, district and town level. The government clearly confirmed the alignment of the project to national development policies, both at meetings with the AR but also through subsequent approval of the tender documents and the awarding of a winner. The field visits to both national authorities (e.g. MPI) and local ones in Lam Son Sao Vang further corroborated this by reiterating the project alignment with the policies and strategies, both at design and now.

JC Rating - - ● – Satisfactory, the project was developed by the local authorities and central level authorities, who repeatedly confirmed its alignment. In the design phase the then newly National Target Programme was developed and aligned to the MDGs. Clearly sanitation was and is seen as a clear priority and a development marker, as it aspired to become a middle income country (which it became in 2010).

JC 1.3 Added value of Project Preparation Facility (PPF)

NA, the project was conceived before the project development facility was available.
JC Rating - NA

JC 1.4 Complementarity with development partners operations and strategies

There has been significant donor support to the WATSAN sector from especially ADB, World Bank and Australia and Denmark has generally cooperated closely with these through sector wide programmes that were closely aligned to the government's programmes. The ADB has also provided support to the sector but mainly urban water supply and sanitation, in the form of concessional finance of close to USD 1bn. ¹⁵⁴

There is only a short paragraph in the main AR, but more elaborate information in annex 3 in the AR where it is a discussion of a World Bank project for rural towns similar to the DSIF project. However, the WB model is criticised for promoting provincial centralisation at the expense of localised needs, making the local O&M companies more passive clients, which could jeopardise sustainability. Hence the DSIF model of having a town level water supply company established is preferred. Moreover, it would probably have been difficult to work through the World Bank scheme, as it is based on a different model (and untied). There are no other donors in the two towns.

JC Rating - - ● – Satisfactory, using the World Bank scheme would probably have complicated and delayed an already complex process of getting the project on track.

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

The project has been identified by the local municipal authorities supported by central level institutions, thus reflecting both local and national priorities and strategies. Clearly the project, once fully operational will deliver substantial development outcomes in terms of better sanitation and improved environment.

There is an analysis of the development impacts in the AR which in turn is derived from the feasibility study. The overall impact is expected to be the 'improved living conditions in LS-SV through safe water supply leading to improved sanitary conditions which will also benefit the poorest segments of the population'. Indirectly the impacts pertain to enhanced infrastructure that will promote small industries, handicrafts and tourism generating job and tax revenue. The specific health gains will come from reduction of the disease burden from especially trachoma, diarrhoea, colic and dysentery. However, there is no attempt to target the intervention toward those most susceptible to these diseases nor if it would be feasible to use targeting vis-à-vis the poorest, nor are there any measures of the degree to which the poor will benefit.

JC Rating - - ● Satisfactory. There project will deliver good development impacts and has been selected accordingly, although the AR does not attempt to accurately measure impacts vis-à-vis the most vulnerable.

EQ 1 Overall Rating – - ● Satisfactory, the project is aligned with both Vietnamese, MFA and DSIF strategies and the local authorities have strong ownership.

EQ 2 -Coherence To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?

JC 2.1 Systematic research for coherence with MFA development policies and strategy


¹⁵³ CarlBro : Appraisal, Annex 3 : Socio-Economic Context, p 7. 2004,

¹⁵⁴ ADB : 'Vietnam - Water Sector Investment Program' 2011

As stated in JC 1.1 the project is broadly coherent with MFA policies and does deliver development impact, although without quantifying these nor attempting to optimise these. It is also coherent with DSIF strategies and policies.

It was also coherent with both Danida country strategies from 2000 and 2006 which focused on providing water and sanitation services to deprived areas, with grant aid focused on rural areas, whereas DSIF would focus on smaller urban ones. At that point in time the substantial grant funding also offered Danida entry into key policy dialogues around water and sanitation issues, further strengthening coherence.


The various monitoring and progress reports are mainly focused on the technical and contractual aspects and do generally not address coherence issues. However, there is obviously verification of progress as regards the construction of a plant, length and type of pipe network installed and, at later stages, the number of connected households. The final verification report (2018) also confirm that the project delivered expected outputs.

JC Rating - -  Satisfactory, it is coherent with all relevant policies, and while the progress and monitoring reports do focus on technical aspects, there are no reasons to believe the project has not remained coherent. In particular the project was highly coherent with the Danida country strategies at the time of the design with DSIF play an important part in the substantial portfolio within water and sanitation that also offer entry points for policy dialogue on e.g. inclusive and sustainable tariff regimes.

JC 2.2 Synergies /complementarity with other Danish development initiatives

The overall DSIF WATSAN portfolio was to a large extent designed to complement the substantial Danida grant portfolio. That also helped shape the focus of DSIF engagements, as Danida grant finance phased out of urban areas, DSIF would increasingly focus on these, especially small to medium sized urban areas where there was limited attention. This project is an articulation of this strategy.


At project level, the embassy has been active in coordination and exchange of information with both government and other development partners. Some coordination has taken place informally, also using the embassy. There is several other DSIF projects in Vietnam within the water and sanitation sector and synergies have been made in terms of e.g. O&M training. However there has been limited synergies with Danida grant financed activities, the project has mostly been complementary.


JC Rating -  Satisfactory, the project forms part of a strong DSIF and Danida grant portfolio that have clear and well defined complementarities, with DSIF focusing on urban areas and Danida grant increasingly retreating to the rural ones. This was clearly outlined in the Danida strategies for Vietnam.

JC 2.3 Danish business links with beneficiary countries

The AR asserts that Danish deliveries should be in core equipment like high standard pumps and their appliances, treatment equipment, transmission and main distribution pipes.




The evaluation team found evidence that there has been use of Danish pumps from Grundfos. Moreover, the contractor, Krüger is a long-standing Danish water supply company, now owned by the French utilities company, Veolia. Clearly, some Danish knowhow has been leveraged in the project, but it is difficult to assess the exact 'Danish added value'. It is not clear that the DSIF project has allowed Kruger to expand its business in Vietnam but the parent company, Veolia, has a presence there. There is thus no evidence that the project has leveraged additional Danish FDI. Veolia / Kruger has confirmed this. However the project clearly has strong links to Danish business in the form of both Kruger and Grundfos.



JC Rating - -  Satisfactory. Danish knowhow has been leveraged and some Danish equipment has been used thus ensuring that the project is clearly linked to Danish business interests. However, the project has not directly leveraged additional Danish activities in Vietnam.

EQ 2 Overall Rating - -  Satisfactory, the project is aligned to and coherent to Danish development policies and activities. Moreover it is strongly aligned to and coherent with the Danida strategy of using both grants and DSIF finance to engage in both rural and urban water sectors. This is of course also true for the other DSIF WATSAN project in this period.

There is some training synergies withing the other water infrastructure projects, but limited evidence for a substantial Danish footprint in terms of equipment and leverage of additional Danish FDI.

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>The loan amount was EUR 7,8m which included an interest subsidy of EUR 1,5m, the bank margin was EUR 0,1m, the EKF premium was EUR 0,7m and finally a cash grant of EUR 0,9m. In total the Danida support was thus EUR 3,2 or about 37% of the contract amount. Clearly this could not have been obtained using commercial or development bank sources as the tariff structure and ownership model was not suitable to attract commercial capital. There is no comparison with alternative sources of finance. The financial additionality is principally in the form of concessional funding and grants, which were important given the negative financial rate of return that was demonstrated by the financial analysis that was included in the appraisal study. The primary reason for the lack of financial viability is that tariff, in the short to medium term, cannot cover operating costs with the initially limited number of paying customers. Since the project was not financially viable, commercial finance was not possible.</p>	

JC Rating:  Satisfactory, there is clearly a strong case for DSIF finance as the project could not be financed on commercial terms.
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality
<p>The environmental focus is strong in the appraisal report (the EIA from the feasibility is not available) as is the derived health benefits from having access to clean piped water. The negative aspects of the project are minimised by having an environmental management strategy, that also seeks to make the project energy efficient as to save on CO2 emissions. The local authorities would arguably also have tried to minimise the negative environmental impact themselves, but the Danish contractor may have catalysed additional efforts and the finance clearly made it possible.</p> <p>There is no mention of OHS issues whereas the governance model proposed in the feasibility of establishing a new water supply company is accepted, the only caveat being the staffing level should be increased. However social (especially health) standards clearly have benefitted from the project. Finally, the Danish equipment (e.g. pumps) and high Danish build quality are also non-financial additionality that has been highlighted by local authorities during the field visit, although some stakeholders argued that local contractors are now capable of delivering same high quality.</p> <p>JC Rating -  Partly satisfactory, there seems to be some additionality above the finance and in particular the quality of the construction and equipment, as well as strong environmental focus.</p>
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding
<p>No leverage of other funding sources, as e.g. World Bank would not be able to co-finance a project that is tied to Danish suppliers.</p> <p>JC Rating -- N/A given the modalities of DSIF, in particular the tying of aid to Danish contractors, it is difficult to mobilise DFI finance.</p>
EQ 5 Overall Rating -  Partly satisfactory. The project was not commercially viable but had significant potential health and social benefits are significant, warranting the subsidy. Both the finance and the built quality (including Danish pumps) probably added additionality at that point in time, but with Vietnamese contractors being increasingly competitive also in terms of quality levels and clearly price competitive.


EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	<p>The infrastructure has been implemented in a satisfactory manner, as interviews during the field with PMU, the local authorities and the operator corroborated. However, there is a problem with a sludge tank leaking cause a nuisance for the neighbours, but it is unclear if that is the fault of the contractor. Overall the plant and network handed over was of high quality¹⁵⁵ and is fully operational as of the time of the field visit in May 2021. However, connection take-up has been slower than expected due to non-poor not willing to pay when the perceived their own well as an adequate and more cost-effective alternative.</p> <p>The has been a long lead from final appraisal in 2005 to hand-over in 2018, partly due to the bureaucracy in Vietnam in processing the loan.</p> <p>JC Rating -  Satisfactory: the project implementation has progressed well and is delivering high quality.</p>
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	<p>The project has already improved health standards for those connected and is making workers more productive, further increasing economic growth and development. As of mid-2021 2700 households are connected but an expansion is already planned that is projected to reach 42000 households. So, in the medium to long term the project will outperform expectation as concerns capacity and reach, delivering more than the expected outcomes, but in the short time somewhat below the expected levels.</p> <p>Both poor and non-poor will benefit from the infrastructure, and there are now measures in place to safeguard access for the poor, offering them free connections (non-poor pay EUR 55) and they also have a free monthly allowance of 10m3. However only between 10 to 15% qualify as being poor. ¹⁵⁶ The appraisal report did not detail how the poor would benefit, but mentioned that they would benefit.</p> <p>JC Rating -  Satisfactory. There will be tangible benefits to both poor and non-poor and a contribute to economic growth. Based on most recent projections the project will likely exceed outcomes eventually and there are measures in place to safeguards the poorest. Given the national drive to improve access to safe drinking water these projections have high credibility.</p>
JC 6.3 Environmental, social and governance (ESG) risk management	<p>The project complies with national laws and regulations, with no references to international best practices. The EAI and EMS are made but not available to the evaluation team. The governance risks centre mainly around</p>

¹⁵⁵ Niras: 'Final report on the verification of Lam Son - Sao Vang water supply project' 2018.

¹⁵⁶ Interview with water supply company 7 May 2021.


the implication if a public water supply company is not established and if there is significant risks implied in the population growth projections from the feasibility study. Gender risk are not addressed but it is mentioned that there is a strong gender upside in reducing time to collect water. Generally, the appraisal had very limited focus on governance issues, these being left to local authorities. Eventually these have been solved with the creation of a private water supply joint stock company that has taken over the operation. None of that was foreseen at appraisal, which had expected the Tho Xuan District People's Committee (DPC) to operate the plant.

Some risks have materialised during the construction phase with the site being flooded, causing delays, but the PMU generally appreciated Kruger's / Veolia's professional management. However, to reduce the risks of future flooding, the project had requested better landslide protection but that was not accepted by DSIF and as the contractor had been paid the final instalment the PMU and local authorities had no leverage.

JC Rating -  Partly satisfactory. Except for the environment, there is limited focus on ESG issues and these were left open to be addressed subsequently. With the institutional and governance arrangement for water supply changing over time, this vagueness was appropriate given that the time from appraisal (2004) to completion (2019). The risk management in the case of the flooding incident was appropriate but more efforts could arguably have been made to reduce future risks.

JC 6.4 Contribution to climate change mitigation, green and inclusive development


The project has a strong environmental focus, and the energy efficiency measures (e.g. gravity) is reducing the emission impact, but pressure pump is used to lift water from the river to the plant (50m lifting) having some negative impact as the pump is consuming some energy. The social inclusion aspects are mainly assumed although poor get free connections, which so far have materialised but only for a the poorest of the poor (e.g. around 10% of households). The project has thus already contributed to an inclusive and green development process and with the upscaling plans, these benefits will be extended to even more areas and people, as was confirmed in the field visit.

JC Rating -  Satisfactory. The project have strong positive environmental/health benefits and limited negative one. The social inclusion is also evident in e.g. making connections free to poor people and the planned expansion will extend those developmental and inclusive benefits substantially.

JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth

This project happened long before the HP were published.

JC Rating - NA

EQ 6 Overall Rating  Satisfactory The field visit confirmed that the project is delivering significant health benefits to both poor and non-poor households in terms of a clean water, better sanitation and higher productivity. There is some targeting and some measures applied to maximise development impact by e.g. making connections free for poor and but few efforts to measure development impacts. The planned expansion promises to extend those benefits to far more people than originally envisaged, although there are still challenges in convincing people to give up their own wells and instead pay for piped water. Eventually these challenges should be overcome.


EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
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JC 7.1 Satisfactory development outcomes(using DAC definition of impact)

The field visit confirmed that the project is in now operational (new private company started in 2020) so and it does deliver water to 2.700 household out of 4.500 connected, but still a challenge to convince people to connect and abolish their wells. It is evident that the project is delivering good development outcomes in terms of improve quality of water (quality standards being continuously monitored), highly reliable water supply and less time for water collection. This is helping to driver better health standards and looks set to be expanded to multiple more beneficiaries.


The degree to which Danish exporters have benefited is difficult to quantify, but clearly Krüger – Veolia has benefitted as has the people of Lam Son – Sao Vang towns. It is difficult to ascertain if the balance between the two is appropriate, as the counterfactual scenario of using untied procurement has not been implemented and that lifetime cost of the equipment may differ.

The water company claim that a Vietnamese contractor could have delivered the same project at 60 to 70% of cost (interview 7 May 2021). Vietnamese contractors are now at a quality level comparable to international ones for projects of this size, but there could be issues relating to increased levels of corruption when using local companies.

JC Rating -  Satisfactory. The project once fully implemented will bring benefits to both poor and non-poor and contribute to economic growth. Pro-poor targeting and other measuring have been applied in the form of letting the poor connect without costs and having a free monthly allowance. There are challenges in getting people to connect, but gradually this is being overcome. The benefits looks set to continue as the institutional and governance arrangement are now in place and the financing is sufficient to cover O&M.

JC 7.2 Strong ESG performance of DSIF projects


The project had at the time of appraisal uncertain governance structures, also because the regulatory framework for water supply was being reformed. However, there is now a willingness to include private sector participation and the governance performance has thus improved. The environmental aspects are also improving as beneficiaries improve their access to unpolluted and reliable water, whereas emissions from the treatment plant and pumping stations are minor. Finally, the project also encourage social inclusion with special finance arrangement for the poorest.


JC Rating -  Satisfactory, the ESG performance has improved and looks set to allow for continuation and extension of the substantial benefits produced. However the key driver has been the Vietnamese themselves, which also ensures good ownership and commitment.


JC 7.3 Satisfactory financial returns and portfolio performance

The field study revealed that the infrastructure is not fully utilised yet and hence not getting all the expected returns, implying that the company is currently running the project at a loss, but they expect to turn profitable once more households are connected and tariffs increased. Initially tariffs are kept low to attract more to connect. In the meantime subsidies are needed so the financial returns are low.

Again, there seems to be an appropriate trade-off between development policy and financial prudence, at least from DSIF's perspective


JC Rating -  Satisfactory, the infrastructure is likely to generate returns and DSIF will be paid back, but still remains to be seen exactly how the infrastructure will be utilised and the trade-offs involved.

EQ 7 Overall Rating -  Satisfactory. As confirmed by the field visit, there are already robust development outcomes, in terms of clean and reliable water supply, reducing time to collect it and, more importantly, improving health standards. These benefits are likely not only to be sustained but also significantly expanded to many more households. While the project was not commercially viable it is expected to eventually be able to cover O&M costs as more connections are added. The project is hence likely to generate good returns, and also deliver good development outcomes.

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>The appraisal does not contain an economic rate of return analysis, but states in the Economic Analysis section that 'The appraisal team finds it also very important to appreciate that the rapid development to a city could become a social dilemma if the area is not well prepared with adequate infrastructures. The water supply is a very important social input that is lacking in this context, which is also an economic constraint to the district.'</p> <p>Based on field observation and interview with key stakeholders, PMU included, there are already clear benefits in terms of increased accessibility for 4.700 household piped clean water from the infrastructure which in turn will drive improved health outcomes. However so far only 2.700 of these have had their 'behind the fence' installation made and thus fully connected and using the water. Nevertheless based on experiences elsewhere in Vietnam the expectation is that more and more will connect as wells and other unsafe water sources are being decommissioned.</p> <p>Concerning the availability/reliability of the infrastructure the project is not fully utilised yet but the verification report from 2018 argues that the infrastructure constructed is sound and ready to become online. While not being fully utilised, the O&M is being done properly and competently.¹⁵⁷ The company has a clear profit incentive to make it functional as they derive their income from customers.</p> <p>Finally, the health outcomes have still not been fully documented but should be highly positive. The water quality from plant is frequently monitored.</p> <p>JC Rating -  Satisfactory. With the initial subsidies from both DSIF and the local authorities, the project has come online and deliver clear benefits that will be expanded over time. The project is judged to be economic viable and, eventually also financially viable, hence the interested from private sector companies. The health and environmental outcomes are judged to be sustainable, as there is strong ownership from local authorities, but the organisational set-up is new although the company has experiences from other supply schemes in Vietnam and hence the prospects are encouraging.</p>	
JC 8.2 Level of commercial/financial viability of infrastructure	
I-7.2.1 - AR and monitoring documents comply with on-lending, on-investing conditions.	
<p>In the appraisal the project was deemed financially viable in a 20 year horizon, (2006-2027) but that assumed an investment in a Phase 2 ten years later, amounting to around 1/4 of Phase 1 finance. In this scenario, IRR would 14,2%, and NPV is 22 billion VND, but there would be a negative cash flow for the first 9-10 years. It was deemed necessary to have a local financing to cover the cash flow deficits, particularly at the end of Phase 1.</p>	

¹⁵⁷ Based on visit to project site on 7 May 2021, which included inspection of plant and network.

Generally the project has delivered on most of these aspects outlined in the base scenario. As emerged from the field visit, phase two is under preparation and in the meantime local authorities are covering the negative cash flow. However there has been no updating of the IRR and NPV calculations. Indications are that the borrower has complied with the conditions set forth in the loan agreement and the local authorities commitment to phase two is also a strong indicator of the basic assumptions made at appraisal were correct.


JC Rating -  Satisfactory, the basic assumptions at appraisal regarding connections and capacity has been maintained and delivered. However phase two is still only under preparation, but is likely to be implemented, with the company doing most of the implementation and financing.


JC 8.3 Level of improvements in ESG achievement

The environmental aspects have improved with the better access to unpolluted water, as also evidenced during the field visit. This benefit will only get bigger as the project connects more and more households. Emissions and pollution from increased electricity consumption are minor, not least due to the extensive use of gravity for water distribution.

As the field visit revealed there are clear social improvements with better health outcomes for those connected, as well as time savings, which will disproportionately benefits women. It is reasonable to believe that these gains will persist and extend as more households are connected.

The governance aspect has clearly improved with the instalment of a private company and, according to the company, a clear path toward profitability. However these governance improvements seems mainly driven by Vietnamese actors not primarily DSIF.

JC Rating –  Satisfactory, the environmental, social and governance benefits are likely to be substantial and also contribute to better and more sustainable outcomes, that are scalable. The field visit confirmed this.


EQ 8 Overall rating:  Satisfactory, the project is on track to deliver both the capacity and connections promised, as confirmed from the field visit. This will help the project to become economically, environmentally and socially sustainable. The private joint stock water company also seems committed to undertake needed O&M and capable of doing so.

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
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JC 10.1 Quality of risk management systems and policies on long-term sustainability

The AR does have a risk section and the various monitoring reports also details those not foreseen and proposed remedial actions where appropriate. However, there seems to be limited focus on the post-project sustainability of e.g. tariff structure, the creation of a new water supply company (and its staffing and competencies), and wider O&M issues.


As evident from the field visit, indications are that there is an appropriate trade-off between development policy and financial prudence and with the operational phase now starting the project seems likely to become sustainable once more households are connected and pay their tariffs. The flooding that occurred during implementation was one risk that materialised but was managed well.


JC Rating –  Partly satisfactory. The risk management in terms of technical oversight is sound both in the appraisal and in the actual monitoring of implementation and the constructor responded well to risk mitigation. However there was limited focus on sustainability issues in the appraisal but, as the field phase evidenced, eventually these are addressed by Vietnamese stakeholders.

JC 10.3 Quality of environment, social and governance (ESG) risk management




The project will contribute to a better environment for households that will have access to clean drinking water, but it will also generate more wastewater, a risk for which there was no plans to treat at the time of appraisal. The evidence from the field visit was inconclusive on this topic.

The inclusiveness is also evident but there seems to be no specific measures to enhance the inclusion aspects, apart from the pro-poor connection policy, which was also confirmed during the field visit. Finally there is also the governance risk of establishing a new company to manage the water supply, but evidence from the field phase suggest that local authorities are managing these well. There has been limited monitoring of these risk in the monitoring reports produced but the DSIF consultant.

JC Rating –  Partly satisfactory: The overall environmental impact will be positive but with some negative impacts also, if left unmitigated. These risks have not been systematically monitoring by DSIF and their management left to local authorities. The inclusion and governance risk are also evident, but also not monitored, again with the onus being on local authorities to manage these. In general the local authorities are capable of that, as the field visit also indicated.

EQ 10 Overall Rating:  Partly satisfactory, There is good identification, monitoring and management of technical risks in the project, which has ensured reasonably timely completions with outputs delivered broadly as planned and in the quantities agreed, although the timing has slipped, partly as a consequence of a flooding. However issues pertaining to maximising development outcomes, including optimising sustainability

prospects have been neglected in the risk management and monitoring, although the prospects eventually are rather good, as the field visit also testifies. In general, the field visits and interviews revealed that local authorities have assumed responsibility for managing most non-technical risk related to the project including those pertaining to governance set-up, social inclusion and broader environmental concerns.

<p>EQ 11 Result management system</p>	<p>What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?</p>
<p>JC 11.1 Quality and appropriateness of RMS</p>	
<p>The development logic is basic, but still convincing in terms of clean drinking water driving improved health standards, which is also the essence of the logical framework in the appraisal. The appraisal claims the outcomes will be highest for the poorest segments, but offer no explanation as to why, nor any way to ensure this benign outcome will materialise. Eventually the Vietnamese authorities made connections free for the poorest, thus ensuring significant development impact. Also, as evidenced in the field phase, the dense urban areas are benefitting substantially and they often don't have the option to use ground water from a well. For them the project has delivered significant benefits. Similar for areas where it is difficult to access ground water. The progress report from the contractor and the monitoring reports from the monitoring consultant are generally timely, but focus on technical progress, much less on the results in terms of the sustainability and inclusion aspects.</p>	
<p>JC Rating –  Partly satisfactory. The basic logic is convincing but not particularly elaborated. It is assumed that the impact will be bigger for the poorest, but no measures were proposed by DSIF to ensure this. The actual results reporting focused on technical outputs, not more outcome results. Local authorities have been more focused on these aspects.</p>	
<p>JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio</p>	
<p>The project had rather standard M&E system focused 1) installed capacity of 8.400m³ 2) distribution to get coverage of 76% domestic use of 100 l/c/d, including 86% urban coverage. This translated into some 4.500 households provide through almost 70km of pipes. 3) Training of staff and 5) Water quality standards. The verification report confirmed that the project had mostly complied with all these indicators. The development objective was to 'contribute to improved living conditions in LS-SV through safe water supply leading to improved sanitary conditions which will also benefit the poorest segments of the population'. In the AR, there is no information available on changes to sanitary conditions nor how the poorest benefit. However, eventually the poor did indeed benefit and sanitary conditions have improved, but the M&E did not capture nor monitor these aspects.</p>	
<p>JC Rating –  Partly satisfactory. There is an M&E system but it would appear somewhat narrow in focus</p>	
<p>EQ 11 Overall Rating : –  Partly satisfactory, the M&E covers the basics but could have more specific focus on development issues and the post-project sustainability.</p>	

Field visits and calls



Coagulation tank



Sedimentation tank



18.1.1 Interview with Company and PPC - Lao Son and Sao Vang, 7 May 2021

18.1.1.1 Background intro

Water company and district people's committed (former PMU director).

18.1.1.2 Status

Design capacity 8.400 m³. Company took over from PPC January 2020 to supply drinking water to 4400 household connected. Connected 4.700 households(hh) but only 2.700 use water connection, will expand to 24.000m³ / day to 42.000 hh. Many families have well to draw water from so even if connected they use their own water. So issue of getting people to abolish own source and connect, even if it cost money.

Policy to subsidize connection as well as the monthly for poor. 20 to 30 hh connection are poor. Poor connect for free and get free 10m³ every month for free. Normal family pay 1,5m dong for connection.

18.1.1.3 DSIF why and how did they know about it

1998 they started to prepared and approved 2002, PMU started to be formed (?) in 2006 when some of the interviewees joined.

Rarely discussed with DK and embassy. Would like to have got funding for preventing landslides but Denmark could not do this as the contractor had already got all money so no support.

18.1.1.4 Long-time why

Initial design of project not good, so had to adjust two times. Final appraisal in 2013, start implementation in 2014, finished.

18.1.1.5 Targets at appraisal and de facto

Good target completion and reaching quantitative numbers, problem is getting people to connect and abolish their wells.

18.1.1.6 Added value of Kruger (quality, equipment, OHS)

Used Veolia worked professionally and the equipment from G7 countries e.g. Sneider, pumps from G7 but pipes from Vietnam.

Vietnamese contractor could now do the same level with a price of 60 to 70% of international contractor. Could have done that 10 years ago as well.

18.1.1.7 Sustainability

Collects fees not enough for O&M and get 200m from tariff but have to pay 230 in O&M so lose at least 30m / month but want to encourage new connections. Joint stock company running the plant is financing the deficit. The joint stock company has only this water plant but it is also a construction company. Company has activities mainly in this provinces.

Had to recruit new employees with expertise and the project also had money for training for O&M financed by Denmark. 3 month training.

18.1.1.8 Poverty and outcomes

Advantage is that the water quality is monitored and they don't have to worry about their own water quality. Leading to better health.

18.1.1.9 Lessons learnt

1. PMU should belong to PPC not the district PC, because if PPC it is easier to connect with government and embassy.
2. Project has to repay to DK and expensive. Would rather a Vietnamese contractor as cheaper.
3. Could also leverage fund from domestic investor.
4. DSIF very complex procedures and take long time.
5. International contractor don't understand Vietnamese law leading to problems of complying with law. E.g. with design of pipes under road: Here the contractor have to request to ministry of roads to dig up roads takes time. Local contractor could navigate this faster.
6. Sub-contractor from Vietnam, Veolia is mainly for import. Sub-contractor's working style not good. And sub-contractor respond mainly to Veolia.
7. Tanks at wastewater treatment plant leak water to ground and the sludge permeate the ground. And makes the surrounding houses less worth and they have complained. Now plant has to stop using the tanks. Request contractor to repair tanks, but has not done it. Kruger has received all money so no way to pressure the contractor.

18.1.2 Field report:

18.1.2.1 DAY 1 - 7 MAY 2021

- Travelled from Hanoi to Tho Xuan, Thanh Hoa by taxi, started at 5:30 and arrived at 9:30
- Meeting with Authorities, PMU, operator at treatment plant at 9:30
- Meeting with user at 11:15
- Visit treatment plant at 11:40
- Visit raw water intake station 13:30
- Travelled back to Hanoi by the same taxi, started at 15:00 and arrived at 21:00

18.1.2.2 Findings

- Handover to a new private water supply joint stock company from January 2020, which is funded by water tariffs, which is still insufficient to cover costs.
- Construction and equipment seem were built in high quality.
- Connection fee is free to poor family
- Water price still very cheap (one price VND 5.000/m³) in order to encourage more connection and use.
- A second phase is planned, with both treatment plant expansion and more household connect. This will be privately finance by bank loans to the water company.
- The set-up seems sustainable with more household connections coming online bring in additional tariff revenues. However some households are reluctant to abolish their wells as they deem the ground water quality acceptable.
- There has been a problem that water from the sludge tank permeate to residents houses around the plant. Contractor has not handled the issue and thus the tank is unused

18.1.3 Skype interview: Max Jensen and Søren Carsten Nielsen, Kruger-Veolia 25 March 2021

Only *drinking* water project in portfolio. Construction finalised and handed over. Verification of End of Guarantee expected end of 2019. Increased budget in 2012 and extension in 2017. No feasibility study available. However limited info on the institutional side which included the creation of a new water supply company. Also, absence of details on the revenue structure eventually adopted. Not professional buyer does not know yellow FIDIC. Difficult to finish project. Two year contract but took 5 years to finish.

Also flooding delayed project. Had expected them to operate the plant but they did not. DSIF and embassy helped in getting the hand over to plant in end- of 2019.

19 Vietnam – Buon Ma Thuot Extension of Drainage and Sewerage Systems Project



Overview

Key issues, highlights and lessons learnt
<ul style="list-style-type: none"> • Has been handed to local authorities • Good sustainability prospects based on experiences from first Danida (grant aid) phase • Has received training and sensitisation in first phase, benefits now • More paperwork with shift from grants to DSIF, esp. on the Vietnamese side. More bureaucracy • Still struggling to get households to sign up to connect, especially the poorest. • Health outcomes sure to materialise. • Krüger deliver ok technology for plant and did very good OHS and good project management. • However, Krüger should, according to PMU and local authorities, not have been involved in network and connections: Low tech and requires local context awareness of community practices which Krüger didn't possess.

Summary						
Project name	Buon Ma Thuot – Extension of Drainage and Sewerage Systems Project					
Type of project						
Project No.	104.O.30.Vietnam.MOF.23					
Description	.					
Sector	Water, drainage and sanitation					
Country	Vietnam					
Sponsor	Danida and MoF, Vietnam					
Other stakeholders	Provincial People's Committee, District People's Committee, PMU, Ministry of Planning & Investment.					
Clearance in principle						
Approval/Binding Commitment	May 2015	Loan / Investment Agreement Date			May 2015 (Letter from Nordea to MoF)	
Danish Bank	Nordea					
Loan Duration + Grace Period	10 years					
Project Amount and funding plan	Total project cost EUR 15,3m Total contract €13,2m, Loan €11,3m, €4m from Dak Lak People's Committee					
Danish Exporter						
MFA guarantee	Date	2018	Amount	€11.3m	Duration	10 years
Implementation status	Partly completed.					
Feasibility study details	Not available					
Subsidy – rationale and key features	<p>A financial analysis of the investment in isolation showed a negative cash flow over the entire life of the investment, and the investment thus also had a negative present value, which with a discount factor of 6 per cent. amounts to approx. EUR - 210 million and an internal rate of return (FIRR) of approx. - 2,54 pct.</p> <p>Hence, relatively high wastewater rates will be necessary to make the project sustainable under commercial conditions. Therefore, the project was not viable under commercial conditions, but that the project with a mixed credit financing (from Danida) will be profitable with a rate that does not exceed approx. 10 pct. of the minimum wage per. month.</p> <p>To cover the operating and maintenance costs, the local PPC has announced that it would allocate the necessary resources, which has also been the case in</p>					

Summary	
	<p>previous projects. It will be a condition of support that this be confirmed in writing by the local PPC.</p> <p>The socio-economic benefit of the investment was difficult to accurately value. However, it was considered to be significant when the positive effects associated with the project are taken into account. The direct benefits include, as mentioned, an improvement of the state of health and the standard of living in general in the project area as well as the significant improvements of the environment. In addition, there are indirect benefits related to the development of local business and thereby local job creation. (Bevillingsnotis, 2019)</p>
Country Context	<p>Since the early 2000 has embarked on a policy that aims to provide better sanitation and wastewater treatment to at least 75% of household wastewater, while smaller urban and peri-urban centres should collect and treat 50%. In 2015 Decree No. 15/2015 was been issued to encourage public – private Partnership in infrastructure development with more modalities introduced such as BOT, BOO and DBL (design, build & lease), also with foreign investors being invited.</p> <p>Danida had in the early 2000 constructed the first phase of the treatment plant as well as a sewer network in the city and 10.000 flush latrines. The supports to the water sector was gradually adjusted to emphasize <i>rural</i> water & sanitation in the grant programme, especially after 2005. More than DKK 1,2 billion grants have been disbursed to the water and sanitation sector making it by far the biggest beneficiary sector of Danish grant support to Vietnam.</p>

Evaluation Questions


EQ 1 Relevance + Coherence	<p>What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?</p>
JC 1.1 Alignment with MFA development policies and strategy	
<p>The analysis of the coherence with MFA and DSIF is quite similar to that present in the ARs of Ba Don and Ha Gaing, also formulated by PEM consult. However, there is no direct project objective stated (which is the case in most other ARs in Vietnam) with the outcome being stated as 303ha of the city drained and 8.390 households connected. There is very limited analysis of the socio economic impact, with the AR arguing that the poorest are likely to be based in rural areas, for which the DSIF instrument is unsuited. There is a brief discussion of health benefits which are considered significant but any quantification is dismissed as highly speculative. The AR states that the project will contribute to the GoV's objective of improving sanitation as part of the socio-economic development plan 2006-2010. There is thus a link to the overall poverty reduction objective of MFA, but only weak identification of the causal drivers for identifying how this will be achieved.</p> <p>The alignment with DSIF is not discussed explicitly but it is argued that urban sanitation is more suitable for mixed credits whereas rural areas should be grant based.</p> <p>The project clearly aligns with MFA priorities and strategy in Vietnam at that point in time to focus on water and sanitation and clearly also dovetailed with previous support to the city. It was also consistent with the water and sanitation strategy of Danida (published in 2000).</p> <p>JC Rating -  Satisfactory. The analysis of the poverty impact is weak but overall the project is well aligned, especially to the Danida's strategy for Vietnam at that point in time.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	
<p>There is a listing of the government key policies withing the drainage and sanitation policies of the Government (copied from other PEM appraisals). The project is aligned to those including the Comprehensive Poverty Reduction and Growth Strategy (CPRGS) ambitious aim for all urban wastewater to be treated by 2010. The AR also assess coherence with (then) Vietnam's Development Goal 7, that was to ensure environmental sustainability, targets 95% of the urban population have access to safe water and 40% of the urban population have access to standardized wastewater treatment systems, 80-90% solid waste collected, and with environmental problems in all rivers are basically addressed by 2010.</p> <p>The AR seems to be based on stakeholders views contained in the Works Construction Investment Report (a kind of feasibility report, dated December 2008) which had been made by local authorities and is the basis for the AR.</p> <p>While not particularly explicit about the degree to which the AR has taken into account the stakeholders' views, they are nevertheless most likely the basis for the project. Similarly the fact that the government wrote the basic project documentation should also indicate that it is aligned with the national policies and strategies.</p> <p>JC Rating -  Satisfactory, the project was designed by local authorities and aligned to national policies and strategies. However there is limited reflection of stakeholder consultations in the AR, but that had probably happened during the feasibility phase.</p>	
JC 1.3 Added value of Project Preparation Facility (PPF)	

PPF not used as feasibility study prepared by client was satisfactory.
JC Rating - NA

JC 1.4 Complementarity with development partners operations and strategies


The core donors to the sector include the World Bank, Australia and UK. Under the rural water supply and sanitation programme the World Bank provided an IDA concessional credit of USD 200m.¹⁵⁸ The ADB has also provided support to the sector but mainly urban water supply and sanitation, in the form of concessional finance of close to USD 1bn.¹⁵⁹


There is no discussion of these other development partners operation or strategies (apart from those of the government), mainly due to the fact that they were not active in the area. However, a previous Danida sector programme (grant financed as also mentioned above) is discussed and the DSIF project would extend and complement this. At this point in time (around 2008) Danida abandoned grant based urban water and sanitation programme, instead arguing that this could be financed by DSIF. Instead its grants where to focus on rural water and sanitation. With the absence of other donors, the project was arguably complementary by default. Moreover, there was clear ownership of the project by the local government which assumed responsibility to complementarities with the overall strategies and policies governing the sanitation sector.

JC Rating -  Satisfactory: There were no other donors active in the geographical area but WatSan was supported across Vietnam by the other major donors working in the country.

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

The project will clearly have a development impact as the area, while urban, was one of the poorer in Vietnam. Providing improved sanitation services would clearly benefit both poor and non-poor, as also evidence in interviews with PMU and local authorities. To a large extend, the DSIF relied on previous Danida work on the poverty impact (e.g. the previous project). Hence in the AE there is virtually no assessment of the developmental impact of the DSIF specific investment, apart from a mentioning that the central highlands are poorer than the Vietnamese average.¹⁶⁰ Moreover both central and local authorities had identified this project, mainly due to its expected development impact, upon which the DISF investment relied as part of a framework agreement with the Vietnamese ministry of finance. However in the DSIF specific documentation there was not discussion of the share of poor among the beneficiaries, nor their specific ability to pay. Nevertheless, there is no indication that the richer segments were deliberately targeted (i.e. no elite capture) nor that there were reasons to question the government's own development impact analysis upon which the project selection was based.

JC Rating -  Satisfactory: The project was selected by Vietnamese authorities based on the national strategy to improve sanitation services, not least in underserved areas, where poor people tend to live, Buon Ma Thout included. It will thus deliver benefits to both poor and non-poor and although DSIF did no in-depth analysis of how the project would benefit the poor nor any targeting, the basis foundation and previous analytical work done ensured good developmental impact. It was an appropriate high development impact project for DSIF to have chosen.

EQ 1 Overall Rating -  Satisfactory, the project was designed by local authorities and aligned to national policies and strategies. It was also very aligned to the Danida strategy that had robust focus on sanitation. The project also continued and extended previous support from Danida and so included more beneficiaries and leveraged the past investment. The project is hence highly relevant for both the Vietnamese authorities (who shaped the project modalities and objectives) and the MFA/DSIF, both at global and national level. However, more efforts could arguably have been invested in designing a monitoring framework that could document outcomes subsequently.

EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
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JC 2.1 Systematic research for coherence with MFA development policies and strategy

There is only superficial and largely ceremonial assessment of coherence with MFA and DSIF policies and strategies. On the other hand the project is implicitly quite clearly coherent with MFA and DSIF policies, but the overall objective of poverty reduction is again under-analysed and implicitly assumed.


¹⁵⁸ See World Bank : Project Completion Report – Rural Water Supply and Sanitation Program in Vietnam. 2020

¹⁵⁹ ADB : 'Vietnam - Water Sector Investment Program' 2011

¹⁶⁰ Official estimates of an 4% poverty incidence in Buon Ma Thuot were not found credible and the AR claimed it was higher, without quantifying this

At country level, the project is coherent with the sectoral priorities in the Danida strategy for Vietnam (covering 2006 to 2010) which had strong focus on water and sanitation but made a conscious decision to focus grant support on rural areas, whereas DSIF could focus on urban and peri-urban areas. It was also coherent with the Danida water and sanitation policies as well as DSIF own policies. It also remained coherent with overall Danish (i.e. not exclusively Danida) 'growth market strategy' for Vietnam from 2012, which committed MFA to continue implementing project within wastewater thereby increasing the knowledge to Danish solutions and potentially strengthening exports.

During implementation there has been less emphasis on coherence, reflecting an increased focus on ensuring project traction. The monitoring and reporting have mainly focused achieving physical progress but there are a few that also reports on workers' safety (or the lack thereof, as an accident hurt workers, with the main contractor Krüger/Veola blaming a local subcontractor)¹⁶¹.


JC Rating -  Satisfactory The project is coherent with all relevant policies / strategies even if there is limited explicit focus hereupon during implementation.

JC 2.2 Synergies /complementarity with other Danish development initiatives

In a sense the project is construed as complimentary with previous focus on rural water and sanitation aid (purely grant based), with the appraisal report arguing that urban sanitation is more suitable for loan financing than rural, presumably due to better ability to pay among connected beneficiaries.

The concrete project is a second phase of a previous Danida grant based project and will expand treatment capacity as well as area covered using more sophisticated and space saving innovations (pond-based treatment). As Danida grant strategy exited urban sanitation, but without completing the work in Buon Ma Thout. At this stage in mid-2005 the central authorities had designated the project as a priority for DSIF finance. Thus the DSIF project builds on the previous Danida one, and is arguably the strongest manifestation of synergy and complementarity in the evaluated DSIF portfolio in Vietnam.


The embassy has also been active in remotely monitoring the project but not particularly active in the monitoring meetings, which are also outsourced to SWECO, which also has better technical competencies in that regard.

JC Rating -  Satisfactory. The project builds on a previous Danida project, adding increasing sophistication and innovation. At the implementation level, the project is managed by the relevant local authorities which is ensuring good *de facto* synergies, even if less documented.

JC 2.3 Danish business links with beneficiary countries

The evaluation team found that Grundfos pumps and AVK valves from Denmark have been used for the project. This is primarily due to the inherent qualities of the equipment, not due to its Danish origins. The contractor, Krüger is a company with Danish roots, that is currently French owned, but still with a solid based in Denmark. As of now (mid-20219, there has been no additional Danish DFI leverage by the project, but that could eventually materialise.

JC Rating –  Partly satisfactory, Kruger is an old Danish company and there have been some links to Danish inputs. Moreover, the design process was shared between Vietnam, China and Denmark.¹⁶² It is not clear that the investment will facilitate other non-DSIF investments, although Kruger later won another DSIF tender for sanitation in Vietnam.


EQ 2 Overall Rating –  Satisfactory The project is aligned to and coherent with relevant policies and strategies. Moreover, there are clear synergies with previous Danida support to the town. The DSIF brought increased innovation besides also expanding capacity and outreach. However, there is still limited evidence of the project leveraging additional Danish FDI.

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
The grant element is calculated to be 36,7% (the OECD notification is not available) with EKF providing a 95% guarantee to Nordea bank. The appropriate notice to Danida board argues that the subsidies are need as cost-recovery waste-water fees would be prohibitively high (i.e. more than 10% of minimum wage). The high concessionally is attractive against all commercial alternatives, but again that has to be the case for having OCED approval of tied aid.	

¹⁶¹ See e.g. Krüger/Viola: Quarterly Danida Report 09, March 2018.

¹⁶² Communications with Kruger, March 2021.

Also due to the availability of DSIF finance, the MoF had, after consulting with MPI and local authorities, included it in the priority list of projects for finance by DSIF (as part of the framework agreement). Clearly this has fast-tracked the project and made its early realisation possible. Due to the strong drive for better sanitation in all of Vietnam, and the robust implementation capacity, the project would in all likelihood eventually have been financed using local resources, but DSIF finance allow for much earlier commencement and hence also for the benefits to become available much earlier.

JC Rating - -  Satisfactory, in the counterfactual scenario the project would probably not have been financed without subsidies. Eventually such subsidies may have been provided by central government but DSIF finance allowed for much earlier commencement.


JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality

The design documentation had a rather lengthy EIA which detailed most of the environmental challenges and also had an environmental management plan (the EIA was not available to the consultants, but referred to in the appraisal and tender documents). There is limited reference to other aspects such as climate change and corporate governance. The appraisal highlights that further consideration to OHS should be given in the training plan, and the contractor has also had trainings on these issues, but still with challenges, as accidents have happened.

However, both local authorities and the PMU told Particip that the OHS has been a non-financial added value and has instilled a better sense of how to protect workers' safety and general workplace standards.

Also the technical innovation around pond-based wastewater treatment has been mentioned as an additionality that Kruger brought to the project as has overall project management that complied with high international standards. However, some interviews argued that there had been limited additionality in e.g. connecting households, as that required detailed socio-economic insights into how to convince user to connect; instead Kruger should have focused exclusively on the treatment plant.¹⁶³


There is no noticeable the Crown and Flag effect though clearly Denmark has been engaged the water and sanitation sector, also in Buon Ma Thout, which have instilled confidence in the Vietnamese authorities.


JC Rating - -  Partly satisfactory, as there is focus on especially environmental and OHS issues and some innovation, but implementation has been challenging and the additionality beyond the construction of the plant questionable. The local authorities praised the improvements to workers' safety.¹⁶⁴

JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding

No commercial funding was mobilised

JC Rating - n/a





EQ 5 Overall Rating –  Satisfactory, The project would clearly not have materialised at this point in time, had it not been for the DSIF financial additionality which was clearly needed. There were significant environmental and health externalities warranting the subsidy. It will have clear and obvious development effects. The non-financial additionality is less pronounced but still material. While the OHS measures were insufficient to prevent minor accidents it did reduce risks to workers and served as a good example for the local authorities. Moreover, the project also introduced treatment process innovation, which would probably not have been the case without DSIF.

EQ 6 - Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
Overall the infrastructure has been implemented in a satisfactory manner, as interviews during the field with PMU, the local authorities and the contractor testify. Especially the core plant and the technology introduced here have been highly satisfactory, introducing some innovation as well as better workplace safety. The network infrastructure has also been put in place, but the actual connection have been lagging and there are questions as to the appropriateness of using an international contractor for this aspects, as it requires end-customer engagement and knowledge of the local context. While there are issues with the post-treated water quality, indications are that this is not the contractors fault. ¹⁶⁵	
The implementation pace has been somewhat protracted with more than a decade from appraisals to actual handover, but that is primarily the fault of bureaucratic inertia from the Vietnamese authorities.	
JC Rating -  Satisfactory: the project implementation has progressed well and is delivering high quality.	
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
The main target was to connect 8.390 new households to the network and expand treatment capacity with 5.000 m ³ . The treatment capacity is in place but only around 2.000 households have active connections, primarily due to reluctance to give up their septic tanks, which they can empty for 'free' into rivers. However,	

¹⁶³ Interview with PMU, 5 May 2021.

¹⁶⁴ Interview with Dept. of Planning, Investment & Foreign Affairs, Buon Me Thuot, May 2021

¹⁶⁵ Field visit to Buon Ma Thout 5 May 2021. Main cause of this is that the untreated water is of poorer quality than estimated at design.


<p>there is an ongoing campaign to get more connected and it is progressing, albeit slowly, aided by financial incentives for the poorest. Based on national experiences, the target will be reached but not at the time envisaged.</p> <p>A broader outcome is that the city will become more attractive for both citizen and business (including hospitality sector as the bad odour has dissipated), but there is no attempt to quantify this and that is arguably difficult to do credibly. However the infrastructure benefits the poor and marginalised directly, but there could arguably have been better detailed. Moreover, users no longer have to pay/or spend time for annual household septic tank emptying.</p> <p>JC Rating -  Satisfactory: the project will provide tangible benefits, albeit at a slower pace than envisaged, both for the direct beneficiaries (i.e. those connected) but also for the general city environment which will be improved.</p>	
JC 6.3 Environmental, social and governance (ESG) risk management	
<p>There are discussions around best practices related to technical aspects and some of these discussed the environmental issues (such as size of buffer zones) of the project. However there is clear indication that the project would comply with all relevant national legislation. The appraisal does refer to an EIA done during the feasibility phase, but it has not been available to the evaluation team. Overall the project will clearly improve the environment if implemented successfully. There is a section on risk management in the AR which discuss both technical, financial and sustainability risks and argues that all are manageable, also based on the previous positive experience with the PPC/CPC in the city and region from when Danida provided 100% grant based support. While the ToR for the appraisal does request an assessment of the impact on gender relations, this has not been adhered to in the AR nor is there much attention to gender issues in the rest of the available documentation (which again exclude the feasibility reports).</p> <p>Findings from the field suggest ESG aspects of the project has featured prominently, with the environmental improvement highly tangible in terms of improved living conditions in the city. Also workers' safety has featured prominently and is lauded, despite some minor accidents happening. In terms of governance, the PMU and the contractor have steered the project to its successful completion, but there has been limited DSIF investment in post-project governance set-up; that being left to local and national authorities.¹⁶⁶</p> <p>JC Rating -  Satisfactory. ESG risk have been well managed during implementation and the environmental benefits will be significant and benefit the whole city. However post-project governance set-up has not been detailed but left to local authorities.</p>	
JC 6.4 Contribution to climate change mitigation, green and inclusive development	
<p>Reducing the amount of wastewater that permeates directly into the ground through the septic tank, is contributing to reducing groundwater pollution significantly. In addition the pollution reduction interviews with end-users revealed now do not have bad odours while emptying the septic tank. In addition they save time and, eventually, money from more efficient wastewater disposal. Clearly there will be some increased emissions from the treatment plant and the pumping stations, but these will be relatively minor. Moreover, while the initial roll out is more limited than envisaged, many more will eventually benefit, including both poor and non-poor, thus also contributing to social inclusive</p> <p>JC Rating -  Satisfactory. There are clear environmental benefits, and eventually there will also strong social inclusion aspects although these are hard to quantify.</p>	
JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth	
<p>The project predated the 2019 HP, although this type of project has a small carbon footprint and enhances the local environment.</p> <p>JC Rating - N/A</p>	
EQ 6 Overall Rating -  Satisfactory. Clearly there are strong development effects of improving sanitation and reducing the risk of natural disasters. The direct beneficiaries are those connecting to the new wastewater treatment network and they will experience more convenience and a better environment. The number of direct beneficiaries is expected to grow steadily, but not as fast as initially planned, but with a clear pathway to achieve the number eventually. The indirect beneficiaries are all citizen and business in the city, who will enjoy a cleaner and healthier environment, also enabling the city to be better able to attract new businesses. In sum the development effects will be robust and widespread but with a less aggressive roll-out than anticipated.	
EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)	
<p>Indications are that there will be significant health benefits, in terms of less soil and water pollutions as septic tanks are gradually decommissioned and new wastewater connections are being rolled out. This will also</p>	

¹⁶⁶ Interviews during field visit, 5 May 2021.

improve public health, as the current practice of emptying septic tanks in waterways and dumps clearly exposes humans to unhealthy substances.

The development policy outcomes of e.g. poverty reduction are only implicitly being followed, and not fully documented. Nevertheless, there is arguably an appropriate trade-off between development policy and financial prudence, as the project will most likely be sustainable and deliver substantial development outcomes continuously. Interviews with both PMU, contractors and local authorities corroborated this, as did experiences from elsewhere in Vietnam.


The benefits to the Danish/French company Krüger-Veola are evident and there also appreciation on the Vietnamese side among local authorities, whereas the PMU argued for a more limited role of Kruger/Veolia.¹⁶⁷

JC Rating -  Satisfactory – The project will deliver strong health outcomes drive by less soil, water and air pollution as well as strong environmental benefits. This was confirmed by all interviewed stakeholders. Beneficiaries will have a cleaner and healthier living environment and having the convenience of easy wastewater disposal. All in all highly satisfactory development outcome once roll-out is complete.

JC 7.2 Strong ESG performance of DSIF projects

The project brings positive effects in improving environmental sanitation conditions, improving health and saving environmental sanitation costs for local residents which will likely benefit all including the poor. The field visit confirmed that those areas with connections were experiencing a better environment and these benefits are highly likely to be scaled up as more and more will connect and decommission their septic tanks. The social benefits have also been robust with no indication of richer areas / households capturing a disproportionate share of the connections; indeed the field visit revealed that there is a subsidy scheme in place to ensure better social inclusion.

The governance throughout the implementation period has worked well with clearly defined roles for the contractor, sub-contractors, the PMU, DSIF and local authorities. However, the post-project governance set-up was not detailed in any significant way. This lack of detailing may have been appropriate given the ongoing reform process of the ownership structure and subsidy regimes shaping the governance set-up of the water and sanitation sector. Compared to the situation at appraisal, there is now more involvement of the private sector in managing the wastewater plant and network, also in Buon Ma Thout.¹⁶⁸ Consequently, while the governance analysis and proposed set-up in the appraisal report was weak and not very detailed, the Vietnamese authorities have made significant progress in clarifying the rules and regulations, guiding the sector and setting the scene for more private sector engagement.


JC Rating -  Satisfactory, there have been and will continue to be good ESG performance, although the post-project governance set-up was not particularly well defined in the design and appraisal phase, but is falling into place now.


JC 7.3 Satisfactory financial returns and portfolio performance

The appraisal report detail various scenarios for cost recovery by modelling around different levels of the Environmental Protection Fee (i.e. wastewater management fee) and argues that a fee level that does not allow for recovery of the capital invested (but for O&M) would be both socially and financially feasible. Moreover, the technical solution was found to have low O&M cost further improving the financial returns. Only with DSIF funding would the project be viable. However, the project would continue to be reliant on subsidies from the PPC and hence the appraisal recommended gradual increased to the fee.

At the time of writing (mid 2021) the PPC is still subsidizing O&M and is reluctant to quickly raise fees as that could undermine uptake of connections. However, eventually the fees will be raised but the national law also have some limitations as to the levels.

Interviews confirmed that affordability was a key concern and that the new tariff regime not been fully implemented. Nevertheless there was confidence that regardless of exact tariff structure, the PPC would ensure sufficient funding for O&M.

JC Rating -  Satisfactory, although the returns to the project are still to materialise.


EQ 7 Overall Rating  Satisfactory, the project is on course to deliver sustainable development outcomes that will impact both poor and non-poor, while also benefitting the environment and improve public health. All these benefits are likely to be sustainable. There is no strictly commercial sustainability (hence the need for DSIF), but the project has managed to attract a private company to undertake O&M competitively, with the ambition of reducing the subsidy level and improving management quality.

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
There will clearly be an increase in access to sanitation with the project almost doubling the capacity from 8.125m ³ to 14.200m ³ per day. Moreover the pipe network has also expanded considerably: For drainage by	

¹⁶⁷ Interviews with local authorities and PMU 5 May 2021


¹⁶⁸ Interviews with the Urban Environment Company of Buon Me Thuot, local authorities, and the PMU 5 May 2021

15km and for sanitation by 38km. Design capacity was 8.000 connections for this phase (II), which combined with phase 1 gives a total of 14.500 potential connections. This should be fully economically viable. Until now, there has been more than 7.000 active households connected to the system (from both phase 1 and 2), and PPC and the company are trying to get additional connections also by using subsidies. Specifically, according to PMU, households will be supported with connection fee until August 2021 (after 2 years of handover) at the rate of 1,2 million VND per household and 2,2 million VND for poor and policy households. However, the company will consult the PPC for a new connection support measures after August 2021. Economic viability is thus depending on getting more connections and interviewees expressed optimism in that eventually they would get a sufficient number of active connections. All in all it would appear as the financial, tariff and economic details of wastewater collection and treatment provision have not been fully finalised, partly reflecting the ongoing reform process, but also the fact that the roll-out is still not completed.

JC Rating -  Satisfactory. Although the economic viability, with the current number of connections, is questionable, there is a strong drive to encourage accelerated take-up, which, based on experiences from the first phase, are likely to succeed and become sustainable. The commitment of PPC ensures that financing for core O&M is available. Consequently, future economic viability prospects are bright.

JC 8.2 Level of commercial/financial viability of infrastructure

According to the appraisal, the project will have a negative financial rate return, but with improvements over time as fees are gradually raised. There was no attempt made to do an estimation of the economic rate of return, but the main argument was that the health benefits were substantial enough to warrant assistance. Based on the field visit, it is evident that the infrastructure is being put in place and all indications are that it will be reliable and maintained, partly due to the deliberately low O&M costs. Both to ensure access for the poorest households and to simulate aggressive roll-out, fees are not set at cost recovery levels, undermining the financial viability in the short to medium term. However to encourage private sector engagement and competition, the PPC did a bidding for the management of the project, offering a subsidy.


JC Rating -  Partly Satisfactory – The infrastructure is not profitable nor self-financing, but the local authorities will subsidise and gradually increase tariffs to eventually reach cost-recovery. The financial internal rate of return is consequently negative.


JC 8.3 Level of improvements in ESG achievement

The environment has clearly been a key area where there have been improvements with better drainage and wastewater management delivering significant improvements, building on the achievements from the first (Danida grant) phase. Rivers, soils and air pollution is being reduced and that will accelerate as the roll-out intensifies.

The social improvements are also tangible if still in their infancy. Connected households will have better sanitary standards and there are special provisions for ensuring social inclusion of poorer households. There are thus no indications that the poorer households have been excluded or that the benefits have been captured by the elite.


The post-project governance is probably the area where there has been most uncertainty as the institutional and ownership configuration has changed since the design. Private management is now being promoted and it seems as if the arrangements are falling into place, although the exact details on e.g. future tariff regime are still to be finalised. However judged by the performance of local authorities in phase 1, there are reasons to be optimistic regarding their ability to deliver a viable governance solution. The governance of the project during implementation has been robust, with both PMU, local authorities and contractor generally appreciating the set-up and division of responsibilities.

JC Rating –  The project has so far delivered robustly on all three ESG aspects although the full impact remains to materialise. Environmental standards are clearly improving, the project has strong social inclusion aspects and the governance model emerging has promising potential.

EQ 8 Overall Rating  Probably satisfactory, the socio-economic benefits are potentially substantial and will mostly likely be realised, as the local authorities have a robust track record in maintaining the infrastructure.

<p>EQ 10 Project risk management of DSIF</p>	<p>Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?</p>
<p>JC 10.1 Quality of risk management systems and policies on long-term sustainability</p>	
<p>There are relatively few risk involved in a small infrastructure project using known technology and with a local counterpart that has proven its political and economic commitment to the project. The AR outlines these risk briefly and appropriately. On-site risk appear to centre around OHS, where a sub-contractor has not complied with safety guidelines and with employees becoming injured. The Danish contractor swiftly reacted and insisted that corrective measure were taking, including additional safety training. No other safety incidents have been reported. Based on interviews with PMU, local authorities and the contractor (Kruger) the risk management systems have appropriate and inspiring for the local partners, introducing new standards and best practices for especially OHS.</p>	

As concerns the policies and risk regarding long-term sustainability these have mainly been dealt with by the local and national authorities, that have shaped the incentives and fiscal frameworks that ensures (or inhibits) viability. DSIF has had limited focus and influence on these decisions, already acknowledging at appraisal that it would be domestic actors driving this process. At national level, Danida had previously engaged in policy dialogue on long-term sustainability in the sector (through the SWAP that Danida contributed to), but that is now left to multilateral DFIs.


JC Rating –  Satisfactory, the OHS risk have, despite an accident using sub-contractor, have been managed well and have served as a good example for local partners. As for the long-term sustainability risks these were correctly assessed at appraisal as being low and mainly an issue for Vietnamese authorities to manage.


JC 10.3 Quality of environment, social and governance (ESG) risk management


Better sanitation and drainage will clearly contribute to green and inclusive development and the risks associated herewith have generally been handled reasonably well, and is being praised by PMU and local authorities.

Krüger - Veola have managed ESG risks reasonably well under control, but it is generally not discussed in neither progress nor monitoring reports.

The field visit revealed that the project has been tested for 14 days before handover but now there are indicators the processed water does not meet the new Vietnamese standards as regards pH and Biochemical Oxygen Demand. Consequently the plant has not yet been licensed for discharge, and have not been certified for environmental protection construction. PMU has required the operator and the contractor to look into the cause of the unsatisfactory output quality, but both the contractor and the operator confirmed that the fault was not from their sides. The main issue is that the provided wastewater was of poorer than expected quality. Thus the treated water is of falls outside the discharge quality standards. Efforts are under way to solve the problem, and the involved partners indicated that a solution will eventually be found.

JC Rating –  Partly Satisfactory, the management efforts seem overall proportional to the risk, with a few expectations. However, the failure to achieve the effluent standards required does indicate that there are still some environmental risk that so far prevents the commencement of the plant. The social inclusion risk have so far been managed well, but may be less effective after August 2021, if the subsidies are phased out. Post-project governance risks have been assessed and in large part being well managed by local authorities.

EQ 10 Overall Rating –  Satisfactory, the project has been delivering on the overall low risk, with good management of OHS and also robust long-term sustainability prospects. There is also sound social inclusion and good governance set-up, both during and post-implementation. There are though some environmental concerns on effluent discharge quality of the plant, but work is ongoing to solve this.

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	
The development logic of the AR is very rudimentary, even considering the relatively simple design of the project. Basically improved sanitation and flooding control is intended to deliver better health outcomes and a cleaner, safer environment. While credible, there is very limited analyse of the key drivers and indicators are too imprecise (e-g- x person days of training).	
During implementation the contractor and the monitoring consultant (SWECO) have delivered regular reporting there is limited focus on the core development outcomes and their likely achievements.	
The field phase confirmed that the rudimentary development logic was sound and that the project will most likely deliver on outcomes, but there has been very limited monitoring hereof.	
JC Rating –  Partly satisfactory. The underlying development/change logic is simple but credible. However more nuances could have been made also including ways to maximise developmental outcomes.	
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
The M&E system in the AR is rudimentary and also includes indicators that were irrelevant (e.g. number of household connections which were not part of the contract). There is no methodology for measuring e.g. wastewater quality.	
There is no explicit development objective, but the AR does mention that the project will 'improve living conditions of all, particularly the poor with significant economic and environmental health benefits'. The progress reports are focused on the plant construction and pipe network extension, with limited reference to the overall outcomes.	
Based on field visits the evaluation team could evidence that users have already felt the environmental and economic benefits of the project, as their connections proved both time saving as well as a better environment (e.g. no smelling / leaking septic tank). On the other hand the full results will only emerge once the majority of	

connections become active and when the new plant meets the effluent standards. However, the M&E reporting have not provided such information.

JC Rating – ● Partly satisfactory. The results framework is too rudimentary and too output focused and not consistently followed up in subsequent monitoring. It has provided a poor basis for monitoring development outcomes, although these are likely to emerge regardless. Around 2.000 (out of planned 8.000) have already seen benefits materialising in the form of active connections and these benefits are likely to be sustained.

EQ 11 Overall Rating – ● Partly satisfactory. The *result measurement system* is too basic and too output focussed to provide reliable information on the outcomes of the project and also provides a poor basis for any ex-post evaluation of the project. While the *output monitoring* is relevant it needs to be complemented with higher level indicators, that can capture important outcomes and impacts.

Field visits and calls



Sep 17: Leak testing of MBBR reservoir



Feb 18: Drainage culvert construction STP



WWTP



Chemical room



Biological ponds



Disinfection



19.1.1 Key features:

The project is an extension to an existing system which was supported through a Danida grant sector programme on water and sanitation in the early 2000s, which also co-financed the wastewater treatment plant (WWTP).¹⁶⁹ The AR aims to connect an additional 8.390 households and expand the WWTP capacity from 8.125m³ to 14.200m³. Total cost at appraisal was EUR 15.3m of which DSIF should provide EUR 12m.

Interviews, photo documentation and field report – 4 to 5 May 2021:

19.1.2 Max Jensen and Søren Carsten Nielsen, Krüger/Veolia 25 March 2021

Has made a difference for the communities there but has been complicated. Buon Ma Thuot. A lot of risks involved. Full yellow FIDIC guidelines, but may change. Good DSIF assistance, but could need more from DSIF. It has a strong Vietnamese office (Veolia), that would not have been possible without Veolia office. Has been effective when running into red-tape. Veolia has helped a lot. More operational years included in contracts to allow contractor to run the plants.

19.1.2.1 Added value:

The Buon Ma Thout solution was innovative and saved a lot of space. Design is also key and did take place in Copenhagen, Vietnam and China.

Yes higher workers standards for safety.

19.1.2.2 Foothold

The experience is good and the local office take the lead and strengthen general cooperation. But no direct contracts as a result. Want to continue with smaller projects as well as larger projects.

19.1.2.3 Suez DK company:

¹⁶⁹ The grant project started in 2001 and ended in 2005 with a budget of app. USD 21m.

No never heard of DK presence of Suez. But

19.1.2.4 Monitoring outcomes:

Do some follow from embassy but only for the hand over. Lam Son had no hurry.

19.1.2.5 SWECO monitoring consultant:

had a local guy well experienced. In discussions on getting take-over certificate (ToC) the SWECO guy was concerned to speak out against client. So SWECO was too compliant with buyer and imposed unreasonable demands. Someone in Danida should have stronger engagement when problems are big. Start 2015 (phase two, extension of WWTP). Perhaps finished, as most reporting / documentation seems to have stopped around late 2018. In process of final closure.

More professional owner and the PMU (woman) is good. 2 year contract, one year delay. Also has an innovative solution using a pond system. Also takes care of operation and maintenance. Had a process problem with e-coli standards so had to install a UV machine that they demanded, but once installed they switched it off due to electricity consumption. But in the contract then they should comply.

19.1.3 Interview with Urban Environment Company of Buon Me Thuot Mr. Le Dinh Trung 5 May 2021

19.1.3.1 Background of PC and people

Management of the wastewater plant and pipes of both phase one and two. Beginning it was the also the developer only in 2020 did the PMU separate from the company. Company did equitizations in 2020. 64% private investor (50% 14% employee). Before the company had other projects but currently now only this.

19.1.3.2 Shift from 100% aid to loans?

Same more or less from the same source and there a connection/continuity from phase 1 to phase 2.

19.1.3.3 Support from Denmark incl. embassy

PMU in charge. So ask them.

19.1.3.4 Benefits of use of int'l contractor, Krüger (OHS equipment, ESG, life-costs)

Better quality and good supervision from int'l contractor supervise local contractors.

Quality of effluent water has been poor but now company is cleaning equipment more often. But cannot be perfect. Input water also poorer than expected so need more chemicals.

19.1.3.5 Health impact

Both environment and health status.

19.1.3.6 Sustainability (finance, technical and organizational).

Agreement with GoV to get a yearly budget. Do a bidding for the O&M. Not much competition for the bidding. Regulatory framework not fully settle on environmental standards.

19.1.3.7 Issue of HOUSEHOLDS connections:

Sensitization campaign and financial support (1,2m dong) and poorer get 2,2m dong. Very individual if the take up the offer. Total cost average 10m.

19.1.3.8 Key lessons learnt:

First phase had difficulties in operations. In 2006 the first plant came into operation but they managed to learn and get it running smoothly eventually.

Bad smell: Normal but trying to reduce.

Key lesson: Support from local authorities is important, connection rates need to go up from current 20%. Need further activities to encourage households to join and connect. Also the subsidy time period should be extended.

19.1.4 Interview with Vo Ky, deputy head; Mr. Pham The Cong and Mr. Tran Duc Anh People's Committee, Urban Management/Infrastructure, of Buon Me Thuot. 5 May 2021

19.1.4.1 Background of PC and people

Urban infra people.

19.1.4.2 Shift from 100% aid to loans?

Not much knowledge of this only taking over. But phase was good so no issues.

19.1.4.3 Benefits of use of int'l contractor, Krüger (OHS equipment, ESG, life-costs)

Only involved after completions so not much knowledge of this (talk to construction department).

19.1.4.4 Health impact

Septic tanks polluting the environment and the rivers leading to worse health outcomes.

19.1.4.5 Sustainability (finance, technical and organizational)

The unit taking over after completion. A joint stock company, Urban Environment, a state firm company who successfully since 2019. Not 100% state company, fully qualified.

Finance: The government budget will pay for the O&M. Maintenance is considering by the urban infrastructure department. There is a wastewater fee on water supply as in accordance with the law.

Second phase of treatment plant and same company taking over that is already handling the first phase.

19.1.4.6 Issue of HOUSEHOLDS connections:

Design capacity of phase 2 is 8.000 households but actual connections is only 2.000 (14.500 in total phase 1+2 but now 7.000 connected). Trying to encourage people to connect to increase to meet the design capacity of total 14.000m3. Cost of joining is not the main issue, rather a construction issue. Period of 2 years to ensure that the connection target is met. Has a subsidy for households connections of 1,2m higher for poorer households (1m dong of additional funding)? But only until August 2021 after that no subsidy.

19.1.5 Interview with Mr Dung Nguyen, Dept. of Planning, Investment & Foreign Affairs, Buon Me Thuot project.5 May 2021

19.1.5.1 Background of Dept and people

Planning and development focused mgmt. of ODA project. Handling with relation and solving outstanding issues. Joined in 2004 with a break in between.

19.1.5.2 Shift from 100% aid to loans?

Yes there is continuity but the loans causes more controls and more paperwork. More contracts and takes longer.

19.1.5.3 Support from Denmark incl. embassy

Mostly need support from internal government where most paperwork. PMU handles day to day.

19.1.5.4 Why DSIF

Mainly central government decision, but PPC did proposal/feasibility and was submitted to central government that then took it towards

19.1.5.5 Benefits of use of int'l contractor, Krüger (OHS equipment, ESG, life-costs)

There is high focus on workers safety. FIDIC template is used and very strict about terms and conditions. Using international standards. Equipment is good quality according to the standards. First time they use int'l contractor so it is hard to compare with others. Highly satisfied overall.

19.1.5.6 Health impact

Urban environment will improve considerably. Health standards will also improve as many areas don't have any proper sanitation now, but will get as part of the problem.

19.1.5.7 Sustainability (finance, technical and organizational)

According to law the project will be handed over to local authorities who will assume responsible.

19.1.5.8 Issue of connections:

HOUSEHOLDS needs to co-finance the connection which can be a problem. Covid 19 has also delayed everything.

19.1.5.9 Key lessons learnt:

PMU should be experienced and also ensure that the water quality meeting the strict quality standards for effluent water. Here the advisory services from e.g. international experts need experience. Need to have funds to solve these issues.

19.1.6 Interview with PMU dir. Pham Thanh Suong of Buon Me Thuot project. 5 May 2021

19.1.6.1 Shift from 100% aid to loans, difference?

Phase 1: Ms Sung not manager. Many differences PMU more in control in second phase before central government more in sector control. But gained good experience in ODA management in phase 1 useful in phase 2. Technology in phase 1 was very simple (biological pond treatment) phase 2 better technology (ECP contract). Overseas consultant also supervise construction is according to specifications. Problem of money for management of effluent. Last month a Danida team went to BTM to issue certificate for contractor, but as effluent standards not met, so not issued. Maybe technology not good enough but contractor argues that the influent (wastewater) is de facto worse than specified in contract. Need to measure effluent, but no money for measuring effluent quality.

19.1.6.2 Support from Denmark incl. embassy

PMU send report to embassy on lower effluent standards but limited competencies on water quality standards on the Danish side. Need the right expert to evaluate the reasons for lower effluent quality.

19.1.6.3 Benefits of use of int'l contractor, Krüger (OHS equipment, ESG, life-costs)

Veolia has limited experience with network and also limited control with subcontractor as they are bad a HOUSEHOLDS communication and engagement. So only treatment plant is appropriate for international contractor. Also money saving.

19.1.6.4 Health impact:

Yes substantial benefits on health and ground water. Before no network to collect wastewater.

19.1.6.5 Sustainability (finance, technical and organizational).

Difficult issue of finance in PPC, but there is commitment to clean up environment. And there is heavy pressure from central government to comply otherwise punished.

19.1.6.6 Issue of HOUSEHOLDS connections:

1700 households connected. Media must be used to promote connections. And regulation must be better in place and have stronger penalties for not connecting and bigger subsidies for connecting. Poor people are ok, as they get higher subsidy and their houses are more easily connected.

19.1.6.7 Key lessons learnt:

In the future Danida should have better technology control of the contractor. Also only contract for the international contractor for core technology part, not network which requires intimate knowledge of local communities and practices.

Disbursement in the agreement did not correspond with the real time to get disbursement (i.e. Too long disbursement time causes delays). Also due to GoV intricacies, but should be taken into consideration. Easier in the first phase.

19.1.7 Interview with Jørgen Bygvraa Hansen, SWECO, Monitoring consultant. 12 April 2021

Different types of roles e.g. appraisal of feasibility studies (7 projects). Many FS were too weak requiring substantial work. SWECO also involved in grant project in Dalat and Buon Ma Thout the latter expanded by DSIF project.

DSIF is much more contractual than grant based aid. The latter much more sustainability focused and also poverty focused. Much focus on training and user involvement, including coop with health sector. Very much project and contractual. Training of O&M only.

19.1.7.1 Value added of DK is there.

At that point in time they needed international expertise and know-how. Poor quality contractors and DK could provide better but not always. E.g. Bac Gaing had also problems with DK contractor had not invested sufficient in training and O&M, but also quality issues.

Suez not a Danish company, but limited competition.

Bac Giang engagement stopped before it became really operational. However general impression is that most projects continued as expected. Bac Gaing small city leading to problems with management competencies leading to problems.

Good to **move away from smaller projects** with too much hassle for too few money.

19.1.7.2 Long lead time:

Yes in BG an area was cut from the pipe network as price escalation had render the budget unrealistic. Especially, the Vietnamese procedures are onerous but has to live with that. The new PDF is a good facility and there is still good ownership and dialogue.

OHS is better with DK contractors but even better in grant aid.

19.1.7.3 Conflicts and disputes:

Name of the game, cannot be avoided. However, the better feasibility and better tender then it is less likely to occur. Also a question of personalities e.g. Buon Ma Thout is very efficient.

19.1.8 Key field findings:

19.1.8.1 DAY 1 – 04 MAY 2021

- Travelled from Hanoi to Buon Me Thuot by bus taxi and airplane, started at 10:30 and arrived hotel at 16:30.
- stayed at the Thien Nga Hotel

19.1.8.2 DAY 2 – 5 MAY 2021

- Meeting with Dak Lak department for Planning and Investment at 8:00
- Meeting with Urban Management division of Buon Me Thuot city, Finance and Planning division of Buon Me Thuot city at 9:15
- Meeting with Dak Lak Urban and Environmental Join Stock Company (operator of the project) at 11:00
- Meeting with user at 12:30
- Visit WWTP at 12:50
- Meeting with PMU at 13:50
- Travelled back to Hanoi by taxi, plane arrived at 19:15

19.1.9 Findings

- Handover to PMU and Dak Lak Urban Environment Company from May 2019 and officially handover from August 2019 but still funded by province's state budget. Buon Me Thuot Urban Management Office will advise PPC to develop a plan to collect discharge fees through water tariff or per capita to fund the project's O&M in the future.
- More than 7.000 households connected to the system,
- PPC and operator are trying to propagate as well as subsidy connection fee to increase the number of connections.
- Has been tested for 14 days before handover but currently there are some parameters such as pH and BOD do not meet type A standard, have not been licensed for discharge, and have not been certified for environmental protection construction, there is no laboratory.
- Contractor and operator confirmed that the fault was not from their sides.
- PMU proposed to use the unused fund find the cause of the problem.
- Project brings significant environmental and economic benefits to the city.

20 Vietnam: Bac Giang Drainage and Support Sanitation

Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> Handover to local authorities happened in 2010 and despite disputes and delays the plant and network operated well until 2020 when the system has been expanded and upgraded to meet updated effluent quality as well as capacity. There are several causes for the disputes the main one includes very long time from feasibility to implementation, uncertainty of how new laws and regulations should be priorities vis-à-vis the contract, lack of agreement of connecting households as well as limited funding for O&M. Danida agreed to finance additional grant based TA to especially O&M training after the hand-over. There is no post-project reporting from local authorities. PMU lacked experience working with international contractor and ability in language, as well as understanding European law, while the MTH contractor, according to PMU, often worked rigidly, leading to the PMU being fined many times during implementation. Danida funding mechanism has been praised as simple and timely and FIDIC consultant from the sponsors worked very professionally and effectively. However, according to the PMU, the direct appointment of contractor without international bidding combined with the fact that were very few Danish contractors in Vietnam caused many difficulties and raised costs in the project implementation.¹⁷⁰ The plant has become a model for environmental excellence. Every year groups of students from universities in Hanoi come to visit and practice at the wastewater treatment plant. 	

Summary	
Project name	Bac Giang Drainage and Support Sanitation Project
Type of project	Water and sanitation
Project No.	104.O.30.Vietnam.3.
Description	<p>The core of the project was the construction of two wastewater treatment plants situated on either side of the main river with treatment capacities of 10.000 and 3.500 m³/day respectively. The chosen technology was based on the Danish developed <i>Biodenitro</i> concept including activated sludge treatment with removal of organic matter, nitrogen and phosphorus. In addition there would be new sewers, interceptors pressure pipes and pumping stations.</p> <p>At appraisal the project had the following components (some of which subsequently reduced):</p> <ul style="list-style-type: none"> 47,8 km new sewers 37,3 km new interceptors 6,6 km pressure pipes Rehabilitation of 12,9 km existing sewer pipes Rehabilitation of 4 pumping stations Dredging and embankment of lagoons for reception of rainwater and overflows of wastewater during heavy rains Construction of two wastewater treatment plants situated on either side of Thuong River with treatment capacities of 10.000 and 3.500 m³/day respectively. The chosen technology is based on the Danish developed Biodenitro concept including activated sludge treatment with removal of organic matter, nitrogen and phosphorus. Various types of trucks (including 3 septic tank suction trucks) and carts Computer and software for the treatment processes Training
Sector	Water, drainage and sanitation
Country	Vietnam
Sponsor	Danida and MoF, Vietnam
Other stakeholders	Provincial People's Committee, District People's Committee, PMU, Ministry of Planning & Investment.

¹⁷⁰ Interview with former PMU staff and People's Committee, May 2021

Summary						
Clearance in principle	May 2003					
Approval/Binding Commitment	October 2003	Loan / Investment Agreement Date			July 2007 (Letter to Nordea)	
Danish Bank	Nordea					
Loan Duration + Grace Period	10 years					
Project Amount and funding plan	Total contract €14,6m, Danish contract €14,2m, difference from local authorities.					
Danish Contractor	MT Højgaard					
MFA guarantee	Date	2017	Amount	1€4,2m	Duration	10 years
Implementation status	Completed, in operation from 2010					
Feasibility study details	Not available					
Subsidy – rationale and key features	<p>It is capital investment, where the main revenue is expected to come from Bac Giang Town People's Committee complemented by 10% user fee on top of the water supply tariff, which together will be able to cover operating, maintenance and investment costs. A financial analysis of the investment in isolation thus shows a negative cash flow over the entire life of the investment, and the investment thus also has a negative net present value, which with a discount factor of 6 per cent. amounts to approx. EUR - 0,02 million and an internal rate of return (IRR) of approx. - 0,5.</p> <p>The socio-economic benefit of the investment is difficult to accurately estimate. However, this is considered to be significant when the extensive negative effects that will be associated with not expanding and rehabilitating the treatment and sewer system are taken into account. This includes the economic costs associated with floods during the rainy season as well as the environmental and health consequences of waterborne diseases.</p>					
Country Context	<p>At the time of appraisal in 2003 Bac Giang Province has a population of 1,6 million, with the town contributing around 100.000 to that total and in the project service area 66.000. The province was slightly richer than then national average and had high economic growth. In the town only 1% were under the poverty line in 2001 whereas the national average was 17%. Population growth was estimated at 2% annually, implying a service area population of 93.000 by 2020. Only 10% of the population had drainage facilities and there was not treatment of wastewater.</p>					


Evaluation Questions

EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners, and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The AR has a short but convincing analysis of the drivers of poor health in Bac Giang and it also asserts that the project complies with the then relevant Danida sector policies for water and sanitation. In addition the AR argues that the environmental and sustainability aspects are strongly aligned to Danida policies. There is even a tenuous reference to the promotion of democracy as the project will support the establishment of a new decentralised structure in local government in Vietnam. The causal pathways of how a sanitation project will contribute to democracy are not made explicit and are not obvious to the evaluation team. Perhaps more importantly the very low level of poverty in the town would somewhat reduce the poverty reduction effectiveness of the project. Nevertheless the project would help make the town a regional centre for economic growth and driver overall poverty reduction in the wider area, including for the rural poor migrating to the town. This was fully in line with both Danida's global policies as well as the Danida country strategy at that time which has the water and sanitation sector as a key priority, both for the grant programme and for DSIF.¹⁷¹ The</p>	

¹⁷¹ Danida: Strategy for Danish Bilateral Development Cooperation with Vietnam, 2000; Danida: Strategy for Development Cooperation 2006-2010- Vietnam, 2010a and Danida: Water supply and sanitation ,

country strategy stated 'The emphasis in the Danish supported programme will be on poverty targeting, national ownership, sector wide approaches and long-term sustainability. Accordingly, the programme will be implemented through the Vietnamese partner systems.'¹⁷² The country strategy also stated that DSIF should 'broaden the sectoral coverage of mixed credits. Public health and vocational training are among the potential new areas of support. There will also be emphasis on increasing the interest of the business sector in these soft loans.'¹⁷³ While the Bac Gaing did not deliver on the broadening ambitions, other DSIF projects did.

As concerns the DSIF strategies and policies it is well-aligned as the project is not commercially sustainable, supports inclusive growth, promotes better environment and is also within a sector 'where Danish expertise is generally at state-of-the-art' (AR p. 44).


JC Rating -  The project is in line with both Danida and DSIF policies, even if the direct poverty reduction potential is somewhat limited. However the official poverty line is also implying a very low level of income and the project will benefit moderately poor as well. The project is clearly not commercially viable and there are good Danish competencies within the sector.

JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account

The then government policy for wastewater was that all densely populated urban areas in Vietnam should establish wastewater treatment systems before 2010, and that all industrial wastewater should be treated before discharge by 2005.¹⁷⁴ The *National Orientation for the Development of Urban Sewerage and Drainage until 2020* from 1999 also states that all urban areas will have suitable drainage systems and wastewater treatment facilities by the year 2020. Moreover the *National environmental strategy 2010* from 2003 had the target that 40% of all urban wastewater must be treated by 2010.

The project clearly contributes to all of these national policies and strategies. It also aligns well with the government's environmental policy of reducing water and air pollution and controlling flooding.

The feasibility was commissioned by the local authorities and the AR consulted with a wide range of stakeholders at both town and provincial level. Hence the project broadly reflects the local stakeholders priorities (and especially the communist party's). There is thus every reason to believe that the project reflects both the local and central governments' priorities.

JC Rating -  Satisfactory. The project is very much designed and owned by the local government and reflect the priorities of it.

JC 1.3 Added value of Project Preparation Facility (PPF)

The feasibility study was done and paid for by the Ministry of Planning and Investment (MPI) and a translated version was made available to the appraisal team. It was not available to this evaluation team (may have been lost in the almost two decades since drafting). The appraisal team generally accepts the proposals made in the feasibility study. However, the evaluation team is not able to assess its quality.


JC Rating - N/A

JC 1.4 Complementarity with development partners operations and strategies

The AR does mention that there are a number of donors involved in the drainage and wastewater sector including the Japanese (Hanoi), World Bank (Haiphong and Halong), Germany (Hai Duong) and the French (Bac Ninh). However there is no explicit mention of complementarities partly because there are no other donors in the town, partly because the government is clearly managing the project.

The core donors to the sector at the time the project was approved were the World Bank, Australia and UK. Under the rural water supply and sanitation programme the World Bank provided an IDA concessional credit of USD 200m. The ADB also provided support to the sector but mainly urban water supply and sanitation, in the form of concessional finance of close to USD 1bn. The government maintains a list of all ongoing and planned projects and allocates them among donors, based on its priorities.

Especially the ADB has been (and is) engaged in policy dialogue with the government on issues of ownership models, tariff regimes and incentives for decommissioning septic tanks.¹⁷⁵ Earlier on Danida was also active in this space but mainly on rural water and sanitation issues. ADB still keeps informing the donor community on the key topics of the conversation.

JC Rating -  Satisfactory. While there are other donors in the sector the project is not competing with these projects as the government is coordinating the allocation of sites to avoid duplication and ensure complementarity. ADB has taken the lead on policy dialogue and thus complement the work of DSIF in that space.

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

Danida sector policies, 2000. See also paper on 'Background and context to the Vietnamese DSIF case studies in water and sanitation' Particip 2021.

¹⁷² Danida: Strategy for Development Cooperation 2006-2010- Vietnam, p. 30.


¹⁷³ Ibid. p.38


¹⁷⁴ GoV: Comprehensive Poverty Reduction and Growth Strategy, 2002


¹⁷⁵ Interview with ADB, April 2021

The general selection has been done by the central government which was coordinating donor projects in the country. The exact criteria have not been available, but overall, the MPI has had a very strong developmental focus in its prioritisation, driven in large part by the need to meet the targets set out in the strategies and policies mentioned above. Thus there is reassurances that the project is identified according criteria that promotes high development impact, even if these criteria have not been available.


In the DSIF appraisal, the overall impact is described as 'Improved living conditions for the inhabitants of Bac Giang urban area and down streams of Thuong River through efficient sanitary drainage and decreased pollution of Thuong River'. This is clearly a positive development outcome but there is no mention of the number of poor people who will benefit from the project and the emphasis is on general improvements in health, productivity, economic growth and employment generation. There is no gender analysis other than the statement that the project will be gender neutral. There is furthermore no discussion of more impacting modalities that could be pursued (e.g. better targeting). However, these trade-offs and calculations may have been made in the feasibility study and overall the project was clearly chosen due to its overall developmental impact, even if not fully quantified.

JC Rating -  Satisfactory: The project would clearly have high developmental impacts in terms of improving living conditions, reducing the disease burden, increasing productivity and contribute to economic growth. The government had a clear developmental focus in its overall prioritisation of projects, of which Bac Giang constituted one. However, there is no analysis in the DSIF appraisal of any measure that could optimise such developmental impacts, but the government's initial prioritisation and the feasibility study have in most likelihood compensated that.

EQ 1 Overall Rating –  Satisfactory. The project is relevant for all involved partners and will clearly benefit all residents in the project area, including the small minority who are poor. The project is also broadly aligned to both local, national and Danish policies, although more analytical efforts could arguably have been invested in detailing and possibly optimising development impact. There was also strong complementarity with other development partners ensuring no duplication but also a division of labour where ADB has been active in the policy dialogue.


EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p>The AR has a rudimentary assessment of coherence with global MFA policies, including those relating to poverty reduction, environment and gender and democracy. In the case of environment, the coherence is highly evident, and there are also some arguments in favour of poverty reduction even if that is a small minority in the town. However, it is hard to see it being aligned the objective of democracy, but it would also be difficult to identify effect full ways of making a sanitation project contribute hereto. Nevertheless the project clearly contributes to the overall objective of poverty reduction.</p> <p>The coherence with DSIF strategies is also assessed in 1.1. and again the DSIF strategies and policies are well-aligned as the project is not commercially sustainable, supports inclusive growth, promotes better environment and is also within a sector 'where Danish expertise is generally at state-of-the-art' (AR p. 44).</p> <p>At country level, the project is coherent with the sectoral priorities in the Danida strategy for Vietnam (covering both the one from 2000-2005 and the 2006 – 2010) which had strong focus on water and sanitation but made, in 2006 a conscious decision to focus grant support on rural areas, whereas DSIF could focus on urban and peri-urban areas. It was also coherent with the Danida water and sanitation policies as well as DSIF own policies. It also remained coherent with overall Danish (i.e. not exclusively Danida) 'growth market strategy' for Vietnam from 2012, which committed MFA to continue implementing project within wastewater thereby increasing the knowledge to Danish solutions and potentially strengthening exports.</p> <p>JC Rating -  Satisfactory. There is good coherence with most relevant priorities of both Danida and DSIF. At global level the project is coherent with the poverty reduction object of Danish aid, whereas the project is also coherent with DSIF's own policies and strategies at that point in time. At national level coherence was already strong initially, but arguably strengthened over time as the grant aid became focus on rural water and sanitation whereas DSIF support to the sector would focus on (smaller) urban centres.</p>	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p>There was robust complementarity with Danida grants projects that increased over time. Grant support to the sector started in the 1990s with a focus on urban water and sanitation but shifted towards rural areas in the mid-2000, as rural poverty was higher than urban, but also because there was more need for subsidies in rural areas. DSIF could then take over in urban areas, at times building on the previous projects and the experiences gained. At the time of appraisal (2003) even grant aid was de facto tied, and Danish companies thus had experience in doing (and monitoring) urban water and sanitation projects upon which DSIF could build.</p> <p>The DSIF focus on smaller urban towns, such as Bac Gain, was strongly complementary with the MFA/Danida grant focus on rural areas. Through the grant aid programme, MFA and the embassy gained competencies, network and experiences and in the sector, which benefitted DSIF and made it easier to navigate the</p>	


bureaucratic structure for e.g. project preparation and approval.¹⁷⁶ In addition, Danida was also active in the donor-government dialogue on key policies and strategies that shaped the framework conditions for e.g. Bac Giang project, further strengthening the synergies and complementarities.


JC Rating -  Satisfactory: The project was highly complementary to the grant activities and both MFA and the embassy had experiences in the sector, providing synergistic support and making the process easier. Over time the complementarity increased with Danida grant aid focusing on rural areas and DSIF on smaller urban ones.

JC 2.3 Danish business links with beneficiary countries

MT Højgaard which implemented the project as the main contractor is a long-established Danish company. Based on the field visit there are indications of Danish equipment being used (Grundfos pumps) and already at the appraisal there was a recommendation on using the Danish-developed Biotenitro process for sludge treatment for the wastewater treatment plants. There is no evidence of FDI in the project, but MT Højgaard subsequently established an office in Ho Chi Minh City for IT visualisations.



JC Rating -  Satisfactory, there is evidence of wider links with Vietnam because of the project and Danish equipment was also used. The contractor subsequently opened an office in Vietnam.



EQ 2 Overall Rating –  Satisfactory: There is strong coherence with other Danish activities in Vietnam with deliberately designed complementarities and synergies with the grant aid. There is also coherence with the development policies, especially regarding the environment and improvement of living standards. The DSIF support also had strong alignment with the Danida country strategies during the 2000s. Moreover the project also engaged a Danish contractor which subsequently opened an office in the country and Danish equipment was used.

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>The total loan amount was EUR 14,6m with the bank margin at 0,20% p.a. to be paid by Danida. The EKF premium: 6,94% flat of maximum loan amount, to be paid by Danida. The upfront subsidy as 3,07% flat of financed amount, to be paid by Danida. That made the total Danida support equivalent to EUR 5,7 million. The underlying interest was 5,8% whereas government of Vietnam's was 0%, which could not have been obtained at commercial funding.</p>	
<p>It is unclear if development funding (from e.g. ADB) would have been forthcoming in the absence of DSIF funding. However it is clear that it was due to the availability of DSIF finance that the MoF, after consulting with MPI and local authorities, included it in the priority list of projects for finance by DSIF (as part of a framework agreement between DSIF and MoF). This fast-tracked the project and made its early realisation possible. Due to the strong drive for better sanitation in all of Vietnam, and the robust implementation capacity, the project would in all likelihood eventually have been financed using local resources, but DSIF finance allow for earlier commencement and hence also for the benefits to become available much earlier.</p>	
<p>DSIF financial additionality was principally through the provision of a subsidised loan and grants.</p>	
<p>JC Rating -  Satisfactory. There was low commercial viability but the local government may have financed it even without Danida funding, using own means but at a much later stage. DSIF finance allowed for early realisation and hence also for the benefits to reach the population earlier.</p>	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework') additionality	
<p>There is a strong focus on environmental aspects in the appraisal report, but that is partly as compensation for the lack of a proper EIA which was not done at the feasibility stage. As the appraisal concluded 'The project is primarily an environmental protection activity, and its net impact is assessed to result in considerable improvement of the environmental conditions in Bac Giang town. The appraisal team recommends that the project is accepted without further environmental impact assessment requirements.' However, these improvements did not materialize to the extent envisaged as only 40% of households connected to the drainage network with the rest discharging into the river.¹⁷⁷</p>	

¹⁷⁶ However, even being able to navigate the system still implied considerable lead time from feasibility to actual implementation. Interview with Danish embassy March 2021.

¹⁷⁷ Grontmij: Project Completion Report, 2013. Observations from the field visit saw clear improvements over the past 8 years with many more connections, but we were not able to quantify these.

<p>There is limited evidence of any particular focus on social standards (e.g. OHS is only mentioned parenthetically) or corporate governance, with disputes between the contractor and the PMU consuming significant attention and resources, even if eventually settled at a dispute adjudication board.</p> <p>There is limited evidence of Danish reputation playing a major role, although prior involvement may have influenced the decision. However, the high subsidy level was probably a major attraction.</p> <p>JC Rating -  Partly satisfactory while the environmental benefits were highlighted the failed to materialise, at least at project completion.</p>
<p>JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding</p>
<p>No bank funding was mobilised</p> <p>JC Rating - N/A even if no other funding was sourced, the project has high potential impact on health outcomes.</p>
<p>EQ 5 Overall Rating –  Partly satisfactory. There was no evident commercial interest in the project and the subsidy was thus warranted resulting in financial additionality. However, there was limited non-financial additionality of e.g. ESG issues was not particularly prominent, with e.g. the acceptance of a feasibility study without an EIA.</p>

<p>EQ 6 - Effectiveness</p>	<p>What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?</p>
<p>JC 6.1 Satisfactory implementation of infrastructure projects</p>	<p>The infrastructure was eventually handed over in 2010 after delays and disputes. However the agree infrastructure was as expected but the buyer failed to achieve the planned number of connections, which undermined initial performance. Also the length of the pipeline was almost halved as compared to the original contract (from 40 to 26km) and the relationship between the contractor and the PMU was conflictual with many claims and variations. Eventually all claims and variations were transferred to the DAB and later settled. However, despite the rather complicated process and the various conflicts the quality of the plant and network has been good as stated both in the completion report and as reveal during physical inspection by the evaluation team in April 2021. Moreover, the plant has now become a model for students wanting to see how treatment plants works and is considered a centre of excellence (it close proximity to Hanoi also helps), which should indicate that there is widespread satisfaction with the plant. ADB is now investing in expanding capacity and increase number of connections also an indication of trust in the core quality of the infrastructure.</p> <p>JC Rating -  Satisfactory: While the original target was reduced and the project marred by conflicts, the infrastructure that was constructed was of high standards and is being well utilised with high satisfaction and significant environmental benefits.</p>
<p>JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)</p>	<p>There is limited direct employment gained from the project. On O&M and managing the plant and network the appraisal estimated that 30 to 35 persons, whereas the overall improvement in the environment and health would contribute to increased productivity, economic growth and employment generation. The project has been operated by Urban Drainage Pumping Centre that belongs to Bac Giang city people's committee since 2010. The centre currently has 50 staffs. The entire system operation fee including workers' wages, electricity (estimated at VND 3.5-4 billion/year), chemicals (estimated at VND 300 million/year), maintenance and equipment replacement is being taken from the state budget of Bac Giang city.</p> <p>These indirect benefits are not quantified as that would not be possible with any degree of accuracy. However, there could arguably have been more quantification of the degree to which poor household would connect to the network, but that did not happen. Nevertheless, it is likely that there are poor among the beneficiaries but their share is thus unknown. The project had not achieved its targets at completion with only 40% of households connected and with severe operational challenges at the wastewater treatment plant. Moreover even after hand-over in 2010, disputes between MTH and the PMU continued and also negatively impacted on the performance and outcome achievements.¹⁷⁸ However, the evaluation team's field visit some 11 years after hand over, reveal a turnaround in the performance with local authorities, managers and beneficiaries expressing satisfaction with the project, which is now completing an extension of the project using ADB sourced finance. The environment has improved considerably according to the users, thus eventually delivering on one of the main outcomes of the project, albeit with a decade's delay.</p> <p>In addition to bringing benefits to Bac Giang, the project also benefits education in general when every year many groups of environmental students from universities in Hanoi come to visit and practice at the wastewater treatment plant.</p> <p>JC Rating -  Satisfactory: While more efforts could have been made in ensuring that poor were among those connected to the network, it is nevertheless evident that both poor and non-poor benefit and that these benefits not only will continue but also be extended as the ADB project completes. While the project experienced many delays and had many disputes with the contractor, it nevertheless ultimately delivered on the expected outcomes. Another significant achievement is that the plant has become a model for students in</p>

¹⁷⁸ Grontmij: Project Completion Report, 2013

the field for environmental improvement in wastewater management. The field visit found that operating performance had greatly improved over the 11 years since handover.

JC 6.3 Environmental, social and governance (ESG) risk management

The project experienced a number of management and governance issues that initially undermined social and environmental achievements. Already at appraisal stage there were several assumptions which can also be characterised as risks, with several of them emerging as critical at project end. Thus the completion report from 2013 (after hand-over) stated that: 'the following 4 assumptions were not met or only partly met:

13. Management and staff able to operate the treatment plant efficiently.
14. System of systematic septic tank emptying established.
15. Pre-treatment of wastewater undertaken, for the effluent to meet standard requirements at all industries.
16. Sufficient funds available for efficient operation and maintenance of the treatment plant.


Consequently the immediate and development objectives were only partly met. ' (p. 14) at the time of the project completion report in 2013.

Against this background Danida decided to field TA to do training of staff to make O&M better, but as the TA consultants stated: 'Throughout our TA works, we have consistently recommended to the local government (BGCP) that they adopt the business enterprise model instead of the Centre for Urban Drainage (CUD). Whilst BGCP and the CUD appear to be somewhat committed to institutional change at an undetermined time in the future, until such time as an autonomous enterprise is established to perform O&M, the situation shall remain as it currently exists, without any distinct improvement in staff performance. Whilst the BGCP has committed to subsidise and allocate an annual O&M budget for O&M of the WWTP and WWPS, the TA Consultant is not confident that the allocated budget is sufficient for sustainable O&M' (Niras, September 2013). The problem was that the governance model for managing the project was too embedded in the overall local government system with the paradoxical consequence that the CUD was at the same time overstaffed yet also deprived of competent and motivated employee due to low salaries and general lack of conducive work ethnics.

However, there have been changes to the governance system since then, with significant improvement consequently, as the field visit, physical inspection and interviews testified. Most importantly the Centre for Urban Drainage, while still public, has been reformed and added highly competent staff with knowledge especially within environmental issues of wastewater management.

With improved management of governance risk, there have been concurrent improvements in environmental standards. Since the system was put into operation in 2010, the quality of treated wastewater met the standards of discharge to type B of water receiving body as designed. However, since 2011, when a new regulation on wastewater quality was issued (QCVN 40: 2011/BTNMT), it is stipulated that wastewater discharged into waterways used for domestic water supply purposes must meet type A by 2020 (Thuong River water is used for domestic water supply in downstream areas). Therefore, the quality of the treated wastewater could not meet the requirements, and had to be improved. In 2020, the wastewater treatment plant was expanded to increase capacity by 10.000 m³/day (20.000 m³/day in total), and renovated the existing system to meet type A. The funding was from ADB loans, and built by Vietnamese contractor. It was in May 2021 under test before handover, but expectations are that the plant will meet these conditions.

In terms of social risks management, there have also been improvements with many more having been connected since hand-over, with benefits being equally distributed to poor and non-poor, including a subsidy scheme to entice poor households to connect.¹⁷⁹

JC Rating -  Satisfactory: The operating model for water and sanitation leaves limited space for outsiders like DSIF to play a role in influencing governance issues, but more efforts could have been warranted to ensure that the governance structures were conducive to proper O&M at hand-over, as well as ensuring household connections. Eventually the plant and its O&M became properly governed and staffed as well as upgraded using a Vietnamese contractor, with ADB funding. Thus the project ended up with good management of the ESG risk, but after a protracted crises, mainly stemming from initial governance inadequacies.


JC 6.4 Contribution to climate change mitigation, green and inclusive development



There were potentially significant environmental benefits, but at the time of project completion, these had not been realised due to the limited focus on ensuring household connections as well as inadequate attention to governance and O&M. This is also likely have reduced the social inclusion benefits that were supposed to accrue. Thus the contribution to green and inclusive development at hand over was limited




However, there has since been a turn-around with especially reforms of the operator, the centre for urban drainage, having improved both the green and social inclusion aspects. The project is now contributing significantly to improving the water quality of Thuong River, as well as upgrading environmental sanitation and reducing flooding in residential areas. The evaluation team recorded the satisfaction of the end-users, the women's union, as well as the local authorities where the project is located.


The project was not expected to contribute to climate change mitigation, but will clearly improve adaptation by upgrading the city's drainage capacity. The emissions for e.g. pumping and treatment are considered small.

¹⁷⁹ Based on interviews and field visit. It was not possible to quantify the number of connections due to DSIF funding as ADB and local resources have since been added.




<p>JC Rating -  Satisfactory. Only part of the environmental and social benefits materialised at project completion. However it improved subsequently as governance reforms were implemented and more resourced were invested in the plant. It is now a model for students on environmental wastewater management.</p>	
<p>JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth</p>	
<p>HP were issued in 2019 almost 10 years after project was built JC Rating - NA</p>	
<p>EQ 6 Overall Rating -  Satisfactory Overall the project delivered the expected developmental effects to the intended beneficiaries, especially concerning improved environment and social inclusion. The project will also deliver on the 'greening' ambitions by having a healthier and more liveable city, with wastewater now being disposed more safely. Thus the overall concept, objective and plan was sound and had strong potential. In retrospect, more attention should have been invested in ensuring better governance structures that would allow for appropriate O&M efforts immediately at hand over. In addition the issue of household connections should also have been addressed at design stage. Eventually the town People's Committee did invest resourced and competencies in the plant and the prospects are now (mid- 2021) substantially brighter with an upgrade in quality, capacity, and outreach imminent.</p>	
<p>EQ 7 Commercial /developmental balance</p>	<p>Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?</p>
<p>JC 7.1 Satisfactory development outcomes(using DAC definition of impact)</p>	
<p>The planned wastewater treatment plants were constructed but there was a significant reduction in the length of the pipelines being reduced from 40 to 26 km (PCR, p. 12). However these are primarily outputs and also reflects budget adjustments post-tender due to changes in Vietnamese law and regulation concerning price escalation from 2007. Neither PMU nor MT Højgaard applied to Danida for changes in scope of services as was mandated in the Buyer/End User's and Exporter's Declaration. This also caused severe and protracted disputes between PMU and MT Højgaard. This may also have impacted on the attention to technical and management aspect of the project. However post-project improvements have been observed and the project has been operated properly, and currently at 85% of design capacity. Moreover, the local authorities are now expanding both capacity and the network with more households becoming connected, using a Vietnamese contractor. It is difficult to judge if these problems are in part arising from the project being tied to a Danish exporter, but it is plausible that a local or regional contractor would have been able to navigate the politics of infrastructure construction with more agility. Nevertheless the project eventually delivered the expected development outcomes, positively impacting on the quality of beneficiaries life and the overall environment of the city. Moreover, the project is being expanded and thus more will benefit from the development outcomes.</p>	
<p>JC Rating -  Satisfactory, with only 40% of households connected and inadequate O&M the project was at hand-over not delivering on the promises at design and even the gains made were being undermined by insufficient maintenance at project completion. The PMU is probably the main culprit here, but arguably more efforts should have been invested in having these issues addressed earlier. However, findings from the field phase revealed a robust turnaround with significantly higher utilisation, more connection and an expansion. DSIF has not monitored these development post-project, but what was at one point a highly problematic project managed to transform into one being a model to be studied.</p>	
<p>JC 7.2 Strong ESG performance of DSIF projects</p>	
<p>As demonstrated above, there has been limited progress on ESG aspects during project implementation and that has contributed to disappointing development outcomes at project completion. At that time, there was only limited progress on the local government's commitment to prioritise O&M, the TA consultants from NIRAS still concluded in 2013 that 'connection works still remains a major challenge needing commitment; and that the sustainability of O&M annual budget still requires the firm commitment of the BGCPC to implement and collect wastewater tariffs.' (p.18). However the evaluation team learnt of strong post-project engagement by BGCPC resulting in higher capacity and improved development outcomes. That has entailed drastically better environmental performance with citizen and local authorities lauding the project for cleaning the cities rivers. Social inclusion has also improved with many more being connected, including the poorer segments of the population. Key driving these improvement has been the governance reforms of the operator, which has been able to recruit and incentivise competent staff in especially environmental management. JC Rating -  Satisfactory, again the onus was clearly on PMU to honour its general commitment to make the project fully operational and sustainable, which did not materialise at project completion. However over time stronger actions have been taken and the plant is now substantially better governed also delivering robust environmental benefits to both the locality and as a learning centre. DSIF (and its consultants doing training) have clearly pressed for these governance reforms that were instrumental in the turn-around, but the causal relationship between this pressure and the local authorities eventually implementing the reforms is unclear.</p>	

JC 7.3 Satisfactory financial returns and portfolio performance
<p>The appraisal argued that in order for the income to balance the costs the drainage and wastewater, the treatment fee should be 50% on top of the water bill instead of the present maximum ceiling of 10% on top. That was not judged to be realistic. Instead it was argued that the local government should commit to subsidising the project post-implementation.</p> <p>Finding from the field visit confirmed both that subsidies were needed and, crucially, that the local government provided these subsidies in adequate amounts to ensure proper O&M. While tariff are being increased very gradually, it is clear that the project is not delivering financial returns.</p> <p>JC Rating -  Partly satisfactory, the project returns to the Vietnamese was not satisfactory initially, but improved over time. The returns to DSIF were satisfactory (Vietnam has honoured all its debt obligations).</p>
<p>EQ 7 Overall Rating -  Satisfactory. There was never a commercial focus nor expectation of a commercial outcome as such (apart from the contractor, MTH). However the development outcomes initially failed to materialise to the extent expected (only 40% households connected) and combined with insufficient O&M efforts during implementation and immediately after project completion, the overall sustainability was severely undermined. However the people's committee and the CUD made corrective actions and the performance has improved notably. This led to much better environmental performance (e.g. cleaner rivers), more social inclusion (poor households connected) all driven by improved governance and increased funding/subsidies.</p>

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>26 km of piped networks has been installed as well as the construction of a 10.000m³/day treatment plant. However with only 40% connected and the plant running at less than half of capacity the economic rate of return is most likely negative at project completion. Too few had access to the new sanitation infrastructure, undermining the expected health benefits. Only later were the local authorities able to extend the benefits to more people and it now finally has economic viability. The expansion of the project using ADB finance also testifies to the economic viability and local authorities generally praised the project despite its troubled past.</p> <p>JC Rating -  Satisfactory. There was a need to ensure better O&M and higher connection levels in order to ensure economic and technical viability, but eventually that materialised after many delays.</p>	
JC 8.2 Level of commercial/financial viability of infrastructure	
I-7.2.1 - AR and monitoring documents comply with on-lending, on-investing conditions.	
<p>The Particip field visit found that:</p> <ul style="list-style-type: none"> • Since the handover from 2010 there has been upgraded and expanded using ADB finance to meet new standard of effluent from 2020. It is now is under test before handover. • The number of household connections is unknown. • PMU had many conflicts with the contractor. • There is Danish equipment. • Users are satisfied with the WWTP and feel that the environment has improved. • Operations and maintenance costs are in part covered by the budget of Bac Giang city. • The PMU and local authorities think that donor should change from direct appointment of Danish contractor to international bidding <p>JC Rating -  Not Satisfactory – Clearly not commercially viable and the economic viability was initially also in doubt, although prospects improved later. Moreover, figures should arguably have been updated following the reduced scope of the project.</p>	
JC 8.3 Level of improvements in ESG achievement	
<p>Clearly the 40% connected households did gain benefits at project completion, but overall the project performed far below expectations also in relation to ESG standards, with poor governance of the plant and limited roll out of house connections. Only over time did the situation improve, as evidenced by the evaluation team, primarily driven by the people's committee and the reforms to the operator (CUD). This has resulted in significant improvements in the environment, where the rivers have become cleaner, and citizen interviewed appreciated this a very tangible achievement. The social inclusion has also improved with many more households being connected, including poorer ones that benefit from a subsidy scheme. There is no evidence of elite capture of benefits. The governance reforms initiated after DSIF support have been instrumental in driving these improvements. The field visit confirmed that the waste water treatment plant brought significant environmental benefits to the city.</p> <p>JC Rating –  Partly Satisfactory, again the initial governance and management of the project was of insufficient quality to ensure the delivery of expected outcomes at project completion, but subsequent remedial action ensured much improved development outcomes also on the environment, social inclusion and governance. The project was not intended to be commercially viable, nor did it become so.</p>	


EQ 8 Overall Rating  Partly Satisfactory, Initially the project failed to deliver on the expected outcomes despite follow up from Danida. However, based on evidence acquired during field visits the project is now properly operated by the Centre for Urban Drainage, and the centre is planning to advise the city people's committee that when the project renovation and capacity expansion is completed and put into operation, the centre's status will be changed to joint stock model and the system operation fee will be taken from 10% of water tariff.

It is and will in all likelihood be economically sustainable as the benefits are clear and tangible to the citizen as well as the overall city, making it a more attractive (investment and living) destination while also improve health and productivity. Socially the project is not also sustainable as the benefits to all sections of the population will continue to be available and there is broad political backing for extending the benefits as Vietnam continues its development drive. The environmental benefits are also substantial and given the strong national commitment to improve the water and air quality, these are also sustainable. The project is not commercially viable and will not become so in the short to medium term, but the authorities are providing sufficient subsidies to the operator. However, this was envisaged at design and also formed part of the rationale for DSIF funding.

EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
JC 10.1 Quality of risk management systems and policies on long-term sustainability	
<p>As stated above there were a number of assumptions at design that can be qualified as risks. However it would appear that the issue and risk of not connecting households was underestimated, as was the degree to which the local authorities would ensure adequate O&M. Nevertheless the contractor managed to install most of the hardware according to the revised scope. Another risks that emerged with protracted conflicts between the PMU and the contractor causing delays and also partly explains the relatively limited achievements at the time of hand-over. The risk management system was not fully capable of managing this risk with the monitoring consultant arguing that the PMU was unused to dealing with international contractors, whereas the PMU and local authorities argued that the contractor had too limited knowledge of the Vietnamese context including the rules and regulations guiding the wastewater sector, instead arguing that a fully open international tender would have minimised some of the risks that materialised.</p> <p>Eventually the local authorities formulated policies on long-term sustainability that enabled the project to deliver on the initial ambitions albeit with almost a decade of delay.</p> <p>The Particip field visit revealed that the PMU had had many disputes with the contractor.</p> <p>The PMU and the local authorities both think that DSIF should move from tied aid involving Danish contractors to international competitive bidding</p> <p>JC Rating –  Partly satisfactory. Governance and economic risks have been underestimated resulting in protracted conflicts with the contractor throughout the implementation period. Governance risks continue post-implementation. However, most infrastructure was installed. Eventually the local authorities were able to overcome most of the risks, with both funding and governance reforms substantially reducing these. Funding for O&M was increased to more appropriate levels, but even more importantly was the governance reforms that made the operator, CUD, more professional, incentivised and capable.</p>	
JC 10.3 Quality of environment, social and governance (ESG) risk management	
<p>The project had the potential to contribute to green and inclusive development, but that was only partially realised at project completion. The monitoring of the risk appears to have been satisfactory once they were identified (arguably late in the process), but difficult to address despite mediate and substantial TA provided on a grant basis. Eventually, the local authorities took action and managed risks, with substantial improvement in all three ESG aspects, with governance reforms, combined with adequate O&M funding driving the process</p> <p>JC Rating –  Partly satisfactory, there has been some progress on environmental and social improvements, but the governance and risk management has been of mixed quality, jeopardising overall sustainability.</p>	
<p>EQ 10 Overall Rating –  Partly satisfactory. The design clearly did not identify some of the most important risks and their potential impacts. However, there have been attempts at addressing these risks, including arbitration and substantial amounts of TA, but this was unlikely to have been able to compensate for not addressing the risk at design stage. Eventually the local authorities were able to overcome most of the risks and deliver solid outcomes.</p>	

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	

The appraisal has a comparatively detailed problem analysis which highlighted the environmental and health challenges as well as the loss of water for productive use (e.g. irrigation). The appraisal also contained a logical framework reflecting the problem analysis. There are only a few monitoring and progress report available for the evaluation team, but these have been submitted timely. However, there are indications that they had inadequate attention to devising a risk mitigation strategy in the development logic.

JC Rating –  Partly satisfactory. The analysis is well developed but the assumption/risk section is inadequate in detailing mitigation strategies (e.g. getting prior commitment to house connections with financial penalties for non-compliance).


JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio


The M&E is mainly a list of inputs (e.g. training days) and outputs (capacity of the plant) but does also have relevant outcome indicators such as the effluent quality and service coverage. As part of the agreement with DSIF, the local authorities were obliged to report on:

- Installed capacity
- Training (man days)
- Yearly production
- Service coverage
- Water/effluent quality

Three years after hand-over non such reports have been forwarded to DSIF, nor is any information that this materialised subsequently.

There are few methodologies for how the M&E indicators would be produced and several are not quantified. The project completion reports (both the technical and the training one) do list a number of relevant lessons learnt for subsequent projects including the ensuring appropriate human and financial resources for O&M, appropriate organisation management structure, pre-project agreement on connection plan and early agreement on dispute adjudication. Clearly these inputs were too late for improving the DSIF management of Bac Giang as the project was handed over and all support was terminated, but it did of course also inform DSIF on wider more systemic issues.

JC Rating –  Partly satisfactory. Overall the post-project reporting on important outcome indicators by local authorities has not materialised which undermines the ability to gauge effectiveness and developmental impact. The log-frame and monitoring framework at design was basic, but was not consistently followed-up. The two project completion reports partly compensate for this, but clearly cannot provide an in-depth analysis of the longer term outcomes, nor could they be used by DSIF to improve the performance of Bac Gaing. The field study by the evaluation team demonstrates that there is a significant learning potential from follow up monitoring.

EQ 11 Overall Rating –  Partly satisfactory: There is a very basic results measurement system designed pre-project but available evidence indicates that there was very limited follow up during implementation and virtually nothing post-implementation. The two completion reports did provide some (worrying) insights. There has been no information on key outcome indicators from PMU such as coverages and quality of effluent water. As the field study by the evaluation team demonstrate, there are significant learnings that better monitoring could capture, especially on key governance issues.

Field visits and calls

20.1.1 Day 1 - 29 April 2021

- Travelled from Hanoi to Bac Giang by taxi, started at 6:00 and arrived at 7:50.
- Meeting with Authorities, PMU, operator at PMU office at 8:00
- Visit WWTP at 9:30
- Meeting with women's union at 10:15
- Visit WWTP again at 13:30
- Meeting with user at 15:00
- Travelled back to Hanoi by the same taxi, started at 16:30 and arrived at 18:30

20.1.1.1 Findings

- Handover from 2010
- Has been upgraded and expanded using loan from ADB to meet new standard of effluent from 2020 and now is under test before handover
- Number of household connection is unknown
- PMU had conflicts with contractor many times
- There are Danish equipment

- Users satisfied with project, feel that environment has improved
- O&M still using state budget of Bac Giang city.
- PMU, authorities think that donor should change from direct appointment of Danish contractor to international bidding
- Project brings significant environmental benefits to the city.

20.1.2 Interview Keld Bøje Nielsen, SWECO FIDIC specialist 25 March 2021.

Bac Giang: Went to DAB, with Keld Bøje as adjudicator ruled that MT Højgaard. Danida financed a solution. Corrupt PMU director wanted specific sub-contractors.

Sub-contractor: If the sub-contractor does not comply then they cannot sack the main contractor. But they know specify the conditions for a specialized sub-contractor forcing the contractor to identify the right sub-contractor in the first place.

Key take-away: Keld is specialized in FIDIC rules and procurement with and also in clean certification. Critical of DK value added in these smaller project. However, the contractors in Vietnam could not deliver without international companies engaged.

20.1.3 Interview with Jørgen Bygvraa Hansen, SWECO, 12 April 2021

Different types of roles e.g. appraisal of feasibility studies (7 projects). Many FS were too weak requiring substantial work. SWECO also involved in grant project in Dalat and Buon Ma Thout the latter expanded by DSIF project.

DSIF is much more contractual than grant based aid. The latter much more sustainability focused and also poverty focused. Much focus on training and user involvement, including coop with health sector. Very much project and contractual. Training of O&M only.

Value added of DK is there. At that point in time they needed international expertise and know-how. Poor quality contractors and DK could provide better but not always. E.g. Bac Gaing had also problems with DK contractor had not invested sufficient in training and O&M, but also quality issues.

Suez not a Danish company, but limited competition.

Bac Giang engagement stopped before it became really operational. However general impression is that most projects continued as expected. Bac Gaing small city leading to problems with management competencies leading to problems.

Good to move away from smaller projects with too much hassle for too few money.

Long lead time: Yes in BG an area was cut from the pipe network as price escalation had render the budget unrealistic. Especially, the Vietnamese procedures are onerous but has to live with that. The new PDF is a good facility and there is still good ownership and dialogue.

OHS is better with DK contractors but even better in grant aid.

Conflicts and disputes: Name of the game, cannot be avoided. However, the better feasibility and better tender then it is less likely to occur. Also a question of personalities e.g. Buon Ma Thout is very efficient.



WWTP



DO meter



Sludge dewatering



Sludge tank



Authorities, PMU, operator



Women's union

21 Vietnam: Vi Thanh Wastewater and Sanitation


Overview

Key issues, highlights and lessons learnt	
<ul style="list-style-type: none"> The commercial contract was signed but awaited for a long time the signed loan agreement from Vietnam. This caused a significant delayed due to lengthy approval process of Ministry of Finance, Vietnam. Validity of contract was actually expired and there was a high risk of cancellation, but in the end the problem was solved. Contracted signed in 2018 but only in 2021 did implementation start. The scope has been significantly reduced: MFA approved in 2013 a project connecting 9.600 households (HH), alter reduced to 6.000 and eventually only 1.400. The current number of HH will result in sub-optimal capacity utilization but phase II is already planned by local authorities. Operation of the plant will probably be by a private company and there seems to be strong commitment. As implementation is just about to start, a field visit was not undertaken. Instead the team conducted remote interview via Teams/Zoom. 	

Summary						
Project name	Vi Thanh Wastewater and Sanitation Project					
Type of project	Wastewater					
Project No.	104.O.30.Vietnam.MOF.23					
Description	The project is intended to improve the sanitary situation in the town, and in particular to improve the water quality of the river and canals in the city. The majority of the households currently have septic tanks and a separate internal system for grey water, which discharge the wastewater into surface drains, rivers and canals. The project will be able to serve 1.400 households (reduced from 9.600 at the time of approval of grant committee in 2013) by establishing connections here. The main reason for the cut was a cost escalation since the feasibility study done in 2012. The treatment plant will have the capacity to treat 3.000 m ³ /day and has been designed for possible expansion at a later stage. In addition, there will be 4 plumbing stations as well as pressure and gravity pipes. The original number of households and the length of gravity pipes was higher in both feasibility and appraisal but reduced during contract negotiated to fit the loan budget of EUR 9m.					
Sector	Water and sanitation					
Country	Vietnam					
Sponsor	Danida and MoF, Vietnam					
Other stakeholders	Provincial People's Committee, District People's Committee, PMU, Ministry of Planning & Investment.					
Clearance in principle						
Approval/Binding Commitment	November 2019	Loan / Investment Agreement Date		November 2019 between Danske Bank and MoF		
Danish Bank	Danske Bank					
Loan Duration + Grace Period	10 years					
Project Amount and funding plan	Total contract DKK €11m, Loan €9m					
Danish Exporter	Suez A/S					
MFA guarantee	Date	2018	Amount	€11,3m	Duration	10 years
Implementation status	Started early 2021.					
Feasibility study details	Two feasibility studies from 2012 and revised 2014					

Summary	
Subsidy – rationale and key features	The appraisal stated that if a commercial export credit was provided the annual net cash flows would be negative during the entire project lifespan, and thus the project would not be financially sustainable. It would require an increase of 5,6 times in the wastewater tariff proposed by the FS, to make the project financially sustainable on commercial terms, which would make waste water services too expensive for the poorer districts of Vi Thanh City. The project was thus considered to be financially non-viable in OECD's terminology, but non-commercially viable. With DSIF grants it would be able to meet O&M cost, but not proper rehabilitation of assets.
Country Context	<p>Vi Thanh is located in Hau Giang province in the Mekong Delta and was in 2004 created as a separate province. Hau Giang province is largely rural and less developed with Vi Thanh as the only city. The province is highly affected by tidal waters and shifting flow directions in channels and rivers.</p> <p>The main industry in Vi Thanh is Vi Thanh Sugar Factory, but the government is turning Vi Thanh into an industrial centre. The city had around 72,000 inhabitants (2009), and was classified as a Class III city. The master-plan for the City included a new administrative city centre.</p> <p>No wastewater in Vi Thanh was treated centrally at the time of design and therefore no wastewater fee collected, but an environmental protection fee of 200 VND per m³ of water used was imposed as a surcharge to water bills.</p>

Evaluation Questions


EQ 1 Relevance + Coherence	What is the relevance of DSIF for MFA, recipient country governments, Danish partners and local stakeholders? Does the DSIF support to preparatory activities contribute to the relevance of DSIF?
JC 1.1 Alignment with MFA development policies and strategy	
<p>The appraisal report (from 2014) does assess the coherence with Danida's overall global objective of poverty reduction poverty reduction as the province is poorer than the national average. However the appraisal also notice that urban poverty, which stood at 7,5% in 2011 was significantly lower than the average poverty rate in the province (21%). As the project exclusively focused on urban areas, the target area had a poverty rate lower than the national average of 11%. Nevertheless the project would also benefit urban poor people but these were not quantified nor were there any measures for specifically targeting these.</p> <p>Concerning Danida's (then) 3 cross cutting issues the AR stated that 1) the project was gender neutral as it would benefit both men and women, 2) that it would have strong environmental outcomes in terms of cleaner water and an overall more liveable city, reducing the disease burden and finally 3) promote human rights and democratisation as the water fees would be raised. The project's contribution to democratisation seems unconvincing but generally there is strong coherence with Danida policies.</p> <p>The project was clearly also aligned to DSIF's policies and strategies at that point in time, supporting a project that was not commercially viable with in the sanitation sector.</p> <p>As concerns the alignment to the country strategy at when the appraisal was undertaken in 2014, this was a time of phasing out of Danida grant finance with most programmes and project either being closed or in the process of being that. There was thus no strict aid strategy, but instead a Market Growth Strategy for Vietnam from the government of Denmark in 2012, followed up the next year with a joint comprehensive partnership agreement between Vietnam and Denmark. Both the strategy and the partnership agreement emphasis the need for increased cooperation within green growth, in particular water and waste management. The Danish strategy went further and argued that the long Danish engagement in the water and sanitation sector had led to the creation of intimate relations between the relevant authorities, constituting a sound platform for Danish commercial actors to penetrate the market. Danida business instruments (of which DSIF is an important one) were explicitly mentioned as key in realising this ambition. In that sense the latest (and probably last) DSIF wastewater project is clearly aligned, albeit it the contractor, Suez, has arguably become a less Danish company over time.</p> <p>JC Rating -  – Satisfactory: The project was coherent with both overall Danida and DSIF's policies although the poverty targeting was somewhat weak and that contribution to democratisation was unconvincing. There was also strong coherence with the Danish country strategy that promoted Danish interests and commercial engagement with the sector.</p>	
JC 1.2 Alignment with national development policies and strategies take stakeholders' views into account	
<p>The project was designed by local authorities and clearly reflected the development policies and strategies. In the feasibility there is repeated references to the GoV's 'Orientation Plan for Urban Drainage to 2025 and Vision to 2050 (November 2009) which stated that urban centres should collect and treat at least 40% of household waste water and that all wastewater from hospitals and industry should be treated. The timeframe was 2015, with even more demanding target set for 2020.</p> <p>More specifically the design has been made to comply with the following policies and standards:</p> <ul style="list-style-type: none"> • Decree No. 88/2007 NĐ-CP on urban and industrial area drainage. 	

- Treated water meeting standard type B according to QCVN 14:2008/BTNMT “National technical regulations on domestic wastewater”.
- National standard TCVN 7957:2008 “Water drainage – External works and network – Design standards”.
- Regulation QCVN 07:2010/BXD “National technical regulations on urban technical infrastructure works”.
- Regulation QCXDVN 01:2008/BXD “Construction planning”. Main design references includes:
- Amendment of master planning of the Vi Thanh city, Hau Giang province by the year 2030.
- Orientation map of wastewater drainage and solid waste management – council of Vi Thanh city up to 2030.

Generally, all of these strategies and policies are part of a drive to improve wastewater management and treatment to ensure cleaner rivers and soils and to reduce especially water-borne diseases.

There has been rather extensive consultation with local and national authorities and generally the government is in full ownership of the project.

The national policy was (and remains) that polluters pay, including households and that drainage and sewerage fees should be based on a principle that all the costs are recovered, and in case of piped water, the wastewater and drainage fee should be charged on the amount of water consumed.¹⁸⁰ If the fee collected was insufficient to cover O&M of the system, the local government should set aside the necessary funds. In practice, the local governments generally therefore subsidized the operation of waste water treatment.

JC Rating -  – Satisfactory, the project was clearly designed and owned by the local authorities and is much demanded. It is based on promoting both national and local level strategies to improve wastewater management with a view to clean the environment and improve public health. The project preparation also had extensive engagement with local stakeholders

JC 1.3 Added value of Project Preparation Facility (PPF)

The feasibility studies was done and paid for by the Ministry of Planning and Investment (MPI) as the ministry wanted close control of the process. The appraisal team generally accepted the proposals made in the feasibility study.


JC Rating - NA

JC 1.4 Complementarity with development partners operations and strategies

There is only a brief mentioning of donors in the AR, and there appear to no other donors in the sector in Vi Thanh. However it would seem that GoV strategy was to mobilise assistance from development partners to co-finance investments in urban sanitation. The main development partners within urban sanitation at that point in time were ADB, JICA, World Bank, GIZ-KfW, AFD, Belgium, Finland and Denmark.

Under the rural water supply and sanitation programme the World Bank provided an IDA concessional credit of USD 200m. The ADB has also provided support to the sector but mainly urban water supply and sanitation, in the form of concessional finance of close to USD 1bn. The government maintains a list of all ongoing and planned projects and allocates them among donors, based on its priorities. There is thus comparatively strong guidance and steering of donor behaviour by the government.


Especially the ADB has been (and is) engaged in policy dialogue with the government on issues of ownership models, tariff regimes and incentives for decommissioning septic tanks. Earlier on Danida was also active in this space but mainly on rural water and sanitation issues. ADB still keeps informing the donor community on the key topics of the conversation.


JC Rating -  – Satisfactory, with no other donors in the city the need for detailed analysis and alignment strategies is limited. Moreover government is very active in ensuring complementarity by steering the allocation of sites to avoid duplication. ADB has taken the lead on policy dialogue and thus complement the work of DSIF in that space.

JC 1.5 Appropriateness of project selection criteria to identify projects with higher development outcomes/impacts

Overall the project is selected by the government and reflects their priorities and selection criteria, the details of which are not known to the evaluation team. However, there has clearly been a drive in Vietnam sanitation sector to improve wastewater management which also driven the government to select project that deliver high development impacts in terms of reach and need. There are not reasons to believe that this is also the case in Vi Thanh where there is a clear need to improve wastewater management.





The long-term objectives of the project are also aiming at delivering robust development impact. This is done to improve living conditions of residents and to promote economic development, by making the city more attractive and productive.

JC Rating -  Partly satisfactory. There project will most likely contribute to positive development impacts, but there is limited efforts in to optimising these nor good ways to accurately measure it.

EQ 1 Overall Rating –  Satisfactory. Overall the project is highly relevant and response to a well identified need in Vi Thanh. The project is aligned with both Vietnamese, MFA and DSIF priorities and has strong domestic ownership. It was also aligned with the new Danish country strategies and policies that encourage

¹⁸⁰ Government of Vietnam decree 04/2007/ND-CP.

more exposure of Danish companies to Vietnam's water and sanitation sector, although the contractor has arguably weak organic Danish links. The strong domestic ownership and development drive also ensure that the project was focused on delivering robust development outcomes, as well as strong complementarity with other donors' engagements in the sector, with e.g. ADB being strongly engaged in policy dialogue.





EQ 2 -Coherence	To what extent has DSIF been able to create coherency with other Danish activities in recipient countries and align to Danish development policies?
JC 2.1 Systematic research for coherence with MFA development policies and strategy	
<p>As stated above there is reasonable coherence with MFA policies on e.g. poverty reduction and that is also expressed in the AR. There is also strong adherence to DSIF policies as it is a sector with relevant expertise does exist in Denmark. Moreover, the project is an environmental project that does not directly generate much revenue, and it is clearly non-commercially viable. However, taking into account the high priority given to the project by the GoV and the provincial authorities, with the choice of an appropriate technical solution, it is likely that it will be financially sustainable, even if it will need subsidy from the Provincial Government in the first years of operation.</p> <p>Efforts from the first AR and onwards have been mainly aimed at reducing the scope of the project by reducing especially the number of connections to make the project fit within the budget envelope. The main objectives did not change and hence it was arguably coherent over time, although implementation has not started (and may not start).</p> <p>At country level, the project is also highly coherent with the overall Danish (i.e. not exclusively Danida) 'growth market strategy' for Vietnam from 2012, which committed MFA to continue implementing project within wastewater thereby increasing the Vietnamese knowledge of Danish solutions and potentially strengthening exports. It is also coherent with the comprehensive partnership where the two governments committed each other to increase cooperation in areas of green technology, water resource management and waste treatment. These areas should be promoted both in general trade and investments as well as through a specific strategic partnership in on climate change, environment energy and green growth. is</p> <p>JC Rating -  Satisfactory, it is coherent with all relevant policies, even if ambitions have been downscaled over time and implementation has been delayed. The coherence has, if anything been strengthened with the increased policy focus on exposing Vietnamese authorities to Danish technologies and practices within the sector, although exclusive focus on that aspect could potentially compromise the overall poverty reduction objective of Danish aid.</p>	
JC 2.2 Synergies /complementarity with other Danish development initiatives	
<p>The project is compatible with the objectives of Danida in terms of improving living standards, especially for the poorest. The embassy has been active in coordination and exchange of information with both government and other development partners, especially during the feasibility and appraisal phase when Denmark was still active in the sector. Denmark has attempted to align its assistance with those of Vietnam at various levels. Nevertheless, there is no evidence that the project was part of such efforts as it is mainly localised. Some coordination has probably taking place more informally with the embassy being informed and engaged in the project preparation phase.</p> <p>There are several other DSIF projects in Vietnam within the water and sanitation sector and synergies have been made in terms of e.g. O&M training. Moreover, the company is drawing on its experiences with previous DSIF projects in Vietnam. Other than that, there is limited evidence of synergies and complementarities with other Danish development initiatives, also due to the fact that all development aid (apart from DSIF) was being phased out during the preparation phase and virtually all completed by the time the projected started.</p> <p>JC Rating -  Partly satisfactory, the project is very local, but clearly builds on both DSIF's and the embassy's strong experience and portfolio in the sector. There have been synergies in for example training with other projects. However, with grant aid being phased out, there have become fewer opportunities.</p>	
JC 2.3 Danish business links with beneficiary countries	
<p>Danish equipment will be used in the project in the form of Grundfos pumps and a scraper from KD – Danish Wastewater Equipment. However as argued in other project reviews, the degree to which Suez can be consider a bona fide Danish company is debatable as its subsidiary in Denmark is small and most of the turnover seems to stem DSIF financing, suggesting the office, at least in part, has been established to allow for bidding for DSIF projects.</p> <p>JC Rating -  Partly satisfactory, Suez has very few links to Danish inputs and wider business community in Denmark. However Danish equipment is being used in some critical parts of the plant.</p>	
EQ 2 Overall Rating -  Partly satisfactory. The project is aligned to and coherent with both all relevant policies and strategies. However there are few links to the wider Danish business community and synergies. Moreover, as traditional grant aid has been phased out, there is limited scope for synergies and to complement other Danish development initiatives.	

EQ 5 Additionality	Does DSIF support investments/projects that would otherwise not have been made, thereby increasing the development effects on the society?
JC 5.1 Financial additionality of DSIF projects	
<p>The following calculation was made in the letter from DSIF to Danske Bank in February 2020: Total finance amount: EUR 9m, interest subsidy amount: EUR 1,3m, bank margin: EUR 0,1m, EKF premium EUR 0,5m, cash grant EUR 1,6m. Thus the Danida support was EUR 3,7m amounting to 41% subsidy share. This could clearly not have been obtained at commercial or quasi-commercial (.e.g. IFIs) sources.</p> <p>No funding was mobilised from commercial or development banks. In the counterfactual scenario of no DSIF funding, it is unclear if other development funders (e.g. ADB) would have been forthcoming. What is clear is that it was due to the availability of DSIF finance that the MoF, after consulting with MPI and local authorities, included it in the priority list of projects for finance by DSIF. This fast-tracked the project and made its realisation possible. Due to the strong drive for better sanitation in all of Vietnam, and the robust implementation capacity, the project would in all likelihood eventually have been financed using local resources, but DSIF finance allow for earlier commencement and hence also for the benefits to become available much earlier.</p> <p>JC Rating -  Satisfactory, there is clearly no viable commercial alternatives. However, other development finance institutions may possibly have financed the project at a later stage and eventually the project would in all likelihood have materialised. DSIF funding made it possible earlier allow benefits to materialise earlier as well.</p>	
JC 5.2 DSIF value (per DAC) or non-financial (MDB's 'Harmonized framework) additionality	
<p>There was clearly a focus on the environment in both the feasibility and appraisal reports. In The former there is an extensive EIA, including a baseline survey, an environmental management and monitoring plan and a public opinion survey. The project was designed to improve the environment by removing, collecting and treating wastewater, which currently discharges to the environment untreated and should have a significant overall environmental benefit. While the appraisal reports emphasis these elements it is not clear that they <i>add</i> to the environmental aspects (i.e. the local authorities were already focused on improving the environment), but the financing will of course make implementation more likely. Moreover, the contractor is increasingly branding itself as a company that is committed to help its clients reach their performance and compliance goals with sustainable solutions. In doing so it is highly transparent on the project management, the equipment provided and the specifications. Hence, DSIF funding should allow for this to materialise due its ability to engage with an international company.¹⁸¹ On the other hand Vietnamese contractors are rapidly becoming competitive on non-price aspects, including environmental management issues, drawing on rapidly expanding pool of high competent engineers and other STEM graduates. As the complexity and technological sophistication of the project is limited, it is becoming increasingly doubtful if Danish companies can provide sufficient non-financial additionality to warrant the higher costs.</p> <p>Concerning occupational health and safety, the appraisal states (almost fully copied from previous appraisals in Vietnam) that OHS are new concerns currently receiving insufficient attention, and that this should be included in the bidding documents. However, interviews with the contractor, combined with the track record of older projects, indicate that OHS is receiving significant attentions.</p> <p>On governance of the project the appraisal asserted that the water company (HAWASUCO) is considered to be able to manage the new wastewater system, provided the technology chosen is not too complicated, and the relevant training is provided. The operation of the sewer network and the treatment plant will be the responsibility of a separate department of the company. The appraisal also proposed training of staff to strengthen the company's ability to manage the plant and pipe network. Again, this was also part of the feasibility, but with more emphasis on training (as is usual for donors) than would otherwise have been the case. All interview stakeholders expressed confidence that the governance of the facility would be satisfactory post-project, but that would primarily be due to local drivers, not DSIF nor the contractor.</p> <p>There is no indication that the Crown and Flag played any significant role, but clearly Denmark (incl. DSIF) was well-known in the water and sanitation sector which has instilled confidence in the Vietnamese authorities.¹⁸² However, Suez is arguably not seen as a particular Danish company.</p> <p>JC Rating -  Partly Satisfactory, as there is focus on these non-financial issues and the financial support will allow for effectuation, once implementation gains traction. However there is limited evidence for real DSIF value added, but they may materialise eventually, but the window for providing substantial added value in small wastewater schemes seems to be closing.</p>	
JC 5.3 Catalytic effect - mobilisation of commercial and development bank funding	
<p>No leverage of commercial or DFI funding. JC Rating - n/a</p>	
<p>EQ 5 Overall Rating –  Partly Satisfactory. There is clearly no commercial viability but the environmental and health benefits are significant, warranting the subsidy. There is thus strong financial additionality. While their contractor has a good track record for delivering non-financial additionality, these are still to materialise</p>	

¹⁸¹ Interview with PMU vice-director 6 May 2021 and contractor project manager, 27 April 2021

¹⁸² Interview with PMU director, 6 May 2021

and cannot be evaluated. However, with Vietnamese contractors becoming increasingly competitive on other aspects than price, the jury is still out on the provision of non-financial additionality.

EQ 6 – Effectiveness	What is the impact of DSIF in promoting development effects for the direct beneficiary and to actors, impacted indirectly (unintended)?
JC 6.1 Satisfactory implementation of infrastructure projects	
There is very limited evidence on the implementation progress as the project implementation has only started in 2021. Covid19 is further reducing implementation speed and monitoring hereof. JC Rating - NA.	
JC 6.2 Projects delivered expected outcomes (in targeted beneficiary populations or more widely)	
<p>The greatest benefit should come from the better sanitation and improved general environment that will make the city more attractive as an investment and tourist destination generating private sector led economic growth and jobs. It is obviously not possible to quantify this impact. What could and should been quantified is the impact on the poor and marginalised among the 1400 households. Nevertheless it is clear that these, regardless of socio-economic status, will benefit substantially from better health and more convenience, as will the whole population in the city as the benefits are extended and the environment improves. Again, these outcomes are still to materialise, but seems highly likely.</p> <p>There will be some employment generation during construction phase but that will be temporary. After completion, only few will be employed for O&M and some job losses may occur as septic tanks are decommissioned and will not need manpower for emptying.</p> <p>JC Rating -  Partly Satisfactory. The project once implemented will bring benefits to both poor and non-poor, primarily through better health outcomes and these benefits will increased as the more gets connected and pollution is lowered. The city will become a more attractive investment destination for businesses and tourist further boosting development impact. However none of this has yet materialised so it is difficult to assign an accurate rating yet.</p>	
JC 6.3 Environmental, social and governance (ESG) risk management	
<p>International best practices will not be used as benchmarks for the project's ESG compliance, instead it is designed to comply with rather strict national laws and regulations pertaining to the sanitation sector, especially concerning the environment. The feasibility study and basic design had a thorough environmental management and monitoring plan, which was supposed to guide implementation. However, implementation only started so there is no way to evaluate if this is also complied with in practice.</p> <p>The risk assessment is mainly focused on the environment, with almost no mention of governance and social risk. OHS is mentioned but not analysed. However, PMU, SUEZ and local authorities expect high OHS standards also due to the reputational risks.</p> <p>JC Rating -  Partly satisfactory. Except for the environment, there is limited focus on ESG issues. More fundamentally implementation will be crucial to test to check for compliance.</p>	
JC 6.4 Contribution to climate change mitigation, green and inclusive development	
<p>There will be a limited negative climate impact as the project will consume some electricity for pumps, but clearly the project has substantial environmental benefits as well as improving flood control, thus improving climate adaptability. Household wastewater dumped directly into the environment will be reduced and even more so after the planned second phase. On balance the project will have strong 'green' benefits</p> <p>Poor women and men (among others) will have more opportunities to engage in productive and income generating activities due to better sanitation and health. However these benefits are not quantified and far fewer than originally expected will benefit in the first (DSIF) phase. Nevertheless there will clearly also be more inclusive development as a results and a strong platform for extending these benefits in a second phase.</p> <p>JC Rating -  Satisfactory. The project is designed have strong environmental effects for those how benefit from it. There will also be social inclusion, and a platform for extending this in the next phase.</p>	
JC 6.5 Compliance with Helsinki Principles (HP) for low-carbon and climate-resilient growth	
The Helsinki Principles were formulated in 2019, whereas the project was designed in 2012. JC Rating - NA	
EQ 6 Overall Rating  Partly Satisfactory (once implemented). The project is designed to bring significant benefits to both poor and non-poor households in terms of a cleaner environment, better sanitation, better health outcomes and higher productivity. However the scope is much reduced as compared to the original designs (from 9.600 to 1.400 households, but phase II will make up for that)	
EQ 7 Commercial /developmental balance	Has DSIF achieved an acceptable balance between the original focus on commercial outcomes and the later focus on achieving sustainable development interventions as part of Danish development efforts?
JC 7.1 Satisfactory development outcomes(using DAC definition of impact)	

The project is still to be implemented making it impossible to assess actual outcomes. However there seems to be a reasonable balance between development policy objectives and financial prudence once the project is implemented. If implementation happens as planned, the project will deliver robust development outcomes, albeit much reduced compared to design. There are reasons to be optimistic that these benefits will be delivered although the contractor is currently stalled in another sanitation project in Ba Don. On the balance, the most likely outcome is that the planned development impact will materialise.

Similar to the other SUEZ won projects, indications are that SUEZ does not expand activities in Vietnam and worse, from a Danish perspective, that the benefits to DK's economy is further reduced due to SUEZ rather non-substantive presence in DK, which seems strongly related to attracting DSIF funding

JC Rating - N/A as project has not yet been built. Potentially partly satisfactory– The project will in most likelihood deliver significant developmental outcome albeit much reduced from what was initially planned. The benefits will be equally spread among poor and non-poor, with no indication of elite capture. Individual benefits will consist of better health and convinces whereas the city as such will have better public health, less pollution and increased attractiveness, both from a business, residential and touristic point of view. Again all this is still to materialise

JC 7.2 Strong ESG performance of DSIF projects

If implemented according to plan, the project will catalyse positive effects in improving environmental and sanitation conditions, improving health for residents which will likely benefit all, including the poor.

The governance aspects are more difficult to predict but there are now clearly defined roles for the contractor, sub-contractors, the PMU, DSIF and local authorities. As regards, the post-project governance set-up, local authorities have established a company to manage the facility and they are confident that this will ensure proper O&M. Compared to the situation at appraisal, there is now more involvement of the private sector in managing the wastewater plant and network, also in Vi Thanh. Consequently, while the governance analysis and proposed set-up in the appraisal report was weak and not very detailed, the Vietnamese authorities have made significant progress in clarifying the rules and regulations, guiding the sector and setting the scene for more private sector engagement.

JC Rating - N/A as project has not yet been built. Potentially partly satisfactory, it is uncertain if and to what extend the project will perform on ESG, with mixed, but mostly positive, experiences from other sites. The environmental and social benefits are likely to be the most robust.

JC 7.3 Satisfactory financial returns and portfolio performance




The project is yet to be implemented and hence it is not possible to assess its financial performance. The appraisal stated that if a commercial export credit was provided the annual net cash flows would be negative during the entire project lifespan, and thus the project would not be financially sustainable. It would require an increase of 5.6 times in the wastewater tariff proposed by the FS, to make the project financially sustainable on commercial terms, which would make the water bill difficult to pay for the poorer segments of Vi Thanh City. The project was thus considered to be financially non-viable.


JC Rating - -N/A as project has not yet been built. Potentially partly satisfactory project is not commercially viable due to low tariffs.

EQ 7 Overall Rating N/A as project has not yet been built. Potentially partly satisfactory. Once the project is implemented it is likely to help raise living standards and increased resilience, also benefitting some poorer households and women. However the numbers of beneficiaries has been reduced and the overall project viability rest on a phase II being implemented subsequently. Finally, the commercial outcomes for Danish exporters is limited given that Suez's hardly qualifies as a bona fide Danish company but some Danish equipment will be provided.

EQ 8 Sustainability	Have DSIF projects been economically, socially and environmentally sustainable?
JC 8.1 Level of economic viability	
<p>Once the project is implemented there will be increase in the coverage of sanitation services and better related infrastructure. However only 1400 households (reduced from Appraisal) will get connections to their houses. The expected economic rate of return was not calculated but likely to be substantial in terms of health benefits, once implemented.</p> <p>The infrastructure, once constructed, will give better sanitation and indications are that the local authorities being willing and able to maintain it post-project ensuring continued access.</p> <p>JC Rating N/A as project has not yet been built. Potentially partly satisfactory. If implemented as planned, there should be a positive economic returns although the number of beneficiaries has been severely reduced. Phase II is planned to achieve original targets.</p>	
JC 8.2 Level of commercial/financial viability of infrastructure	
<p>The infrastructure will not be profitable for a number of years as wastewater tariffs will only be introduced and raised gradually over a number of years. In the meantime the local authorities will subsidise the O&M and also the cost for the poor. However with the lower number of connections the income from tariffs will be even lower, which has not been factored into the revised appraisal.</p>	


JC Rating - N/A as project has not yet been built. Potentially partly Satisfactory – The project hinges on local authorities ability to provide subsidies. These subsidies are likely higher than anticipated and figures should arguably have been updated following the reduced scope of the project.
JC 8.3 Level of improvements in ESG achievement
Once the project is implemented there will be lower pollution and social benefits for those connected, include both men and women. There are no attempts to specifically maximise e.g. poverty of gender impacts. The pollution effects should affect the individuals signing up for the connections, who will have better sanitary conditions at their homes and not have to deal with septic tanks or other improvised sanitary facilities. The whole city will, once the network is sufficiently expanded, benefit from better public health, less pollution of waterways and soil and a generally more inhabitable environment. The latter will also improve the business environment and economic attractiveness. All this on the assumption that the project will be implemented as planned and that the phase 2 will also materialise. Governance improvements are less detailed, but will mostly be driven by domestic actors, not DSIF or the contractor. JC Rating – N/A as project has not yet been built. Potentially satisfactory, once fully implemented. There will be clear environmental improvements if the project and its phase two are implemented. This will have both individual and community wide impacts. The social impacts are also tangible for both individual and the community, but will also hinge on both the project being implemented and that a second phase materialise.
EQ 8 Overall Rating N/A as project has not yet been built. Potentially partly Satisfactory, while the project is expected to deliver significant positive environmental impacts, the economic sustainability may be compromised by the low numbers of users and the low level of tariffs. Much will hinge on the local authorities providing substantially higher than projected subsidies and implementing a second phase.


EQ 10 Project risk management of DSIF	Is the risk management of DSIF appropriate at all stages of the project cycle in the context of current and future investments? What is the future optimal balance for this?
JC 10.1 Quality of risk management systems and policies on long-term sustainability	The original AR has an extensive discussion of the risks, including that of delays, cost escalation and reduction in scope of the project (which have all materialised). The risk mitigation strategy proposed was to commit all parties to give high priority to quick implementation, appropriate allocation of risks and identify potential areas where scope can be reduced without compromising the project. It would seem as if this was not sufficient to effectively mitigate the risks as the project was delayed, with cost escalation reductions in scope and reducing economic viability. JC Rating –  Partly satisfactory. Despite the AR predicting the risks correctly the mitigation did not succeed and the budget and scope of the project, as it was reduced considerably, post-tender.
JC 10.3 Quality of environment, social and governance (ESG) risk management	Once implemented the project should contribute to green and inclusive development, but the risk in getting the project implanted have been substantial and not managed well, although that is probably mainly due to slow processing in the Vietnamese bureaucracy. JC Rating –  Partly satisfactory. While the planned development outcomes are significant, the risks of non-implementation have been high as is the risk that the project will have limited economic viability.
EQ 10 Overall Rating:	 Partly satisfactory, Several risks identified already first appraisal nevertheless materialised, suggesting that the mitigation could have been better executed. However both delays, costs escalation and reduced scope of projects have also materialised in other projects and should be factor into design by making the more realistic concerning prices, timing and scope.

EQ 11 Result management system	What is the assessment of the result measurement system applied by DSIF? Does it meet the needs for providing reliable data on outcomes of project activities during the operation phase and development outcomes in general?
JC 11.1 Quality and appropriateness of RMS	The basic development logic is simple, sound and convincing: Better sanitation will improve the environment and health status. However, there is no analysis as to how many of the beneficiaries will be poor nor any discussion of how to target them. JC Rating –  Partly satisfactory. The development logic is convincing as far as it goes, but it lacks in detail and contextualisation.
JC 11.2 M&E and reporting frameworks effectively and consistently provide accurate and timely information for management of results of DSIF portfolio	
Indicators:	

There is a rudimentary M&E system in the revised appraisal report which is effectively a scaled down version of the M&E in the original AR (6.000 connections vs. 9.600 in the original, which was later reduced to 1.400). There are no health outcome indicators but a proxy is the effluent standard reach b-level in over 95% of the samples.

The overall development objectives centre around 1) improvements in the quality of the water in the rivers and canals (also improving agricultural potential) and 2) improvements in the health situation in and around the city. It is mentioned that the Department of Health collects data on the incidence of diseases, including diseases that may be related to the wastewater (as typhoid or amoebic diseases), and should therefore be able to document the impact of the project. However the project has not started hence no progress or M&E reports.

JC Rating –  Partly satisfactory. The M&E framework is rather basic and the assumptions regarding outreach are likely to be far too optimistic.

EQ 11 Overall Rating  Partly satisfactory. The results framework has been put in place, but is rather basic and too optimistic regarding the targets to be reached.

Field visits and calls

21.1.1 Mr Thong, vice-Director of PMU Vi Thanh Wastewater and Sanitation project. 6 May 2021

- Why DSIF - DSIF is well known in Vietnam and that is where they know if from. Also got advice from other channels incl. MPI/DPI.
- Target of project: 1.400 hh, reduced due to price escalation and hence reduced. But not a problem, and eventually they will get many more hh connection.
- Why delay Mostly due to financial issue as they had to reduce scale of project and that took time. Had to renegotiate with Hanoi and internally.
- Benefits of use of int'l contractor (OHS equipment, life-costs) Suez is a professional contractor and much better than small contractor from Vietnam. Equipment not finalized yet.
- Poverty profile: All households will benefit but in first phase is all kind of people incl poor. Connection is free of charge. Poor people will be subsidized by government, but still not decided exactly how much. Has done a campaign to convince people to abolish septic tanks no problems.
- Health impact Yes health of the city residents benefit and the wider environment.
- Covid -19: Not much impact in the province, Suez and PMU flexible and Suez will
- Sustainability (finance, technical and organizational) Joint stock provincial company has capacity and financial backing. Not an issue. Already running.
- Comments: Work progress should be well managed (!). Better coordination is also needed to speed up project.

21.1.2 Interview with Vu Xuan-Troung, Suez PMU, Vi Thanh Project. 27 April 2021

- Joined since the tender submission in 2017 has also been involved Ba Don.
- Contract 2018, into force in May 2020, started constructed in 2021. Bank / MoF signed a loan agreement on the terms of the loan.
- Doing sewerage work for pipeline and pumping.
- Reduction in HH due to limited budget. In tender 4.400 hh but after tender. 3.000 m3 is still the target, but 1.400 hh is not enough, but PPC will achieve this in phase two.
- Water supply bill will include wastewater bill. Now uses septic tanks with discharge directly into soils and rivers. Difficult to force HHs to connect but the regulation says. Underground water is also polluted.
- Support by DSIF / monitoring,
- Yes get support from DSIF and also need third party advise from monitoring consultant.
- Designs from where:
 - Pipe network has been designed by client. Suez china has done some as designs.
 - DK content: Grundfos pumps will be used. Scrapper from KD.
- Good cooperation with client (PPC), FIDIC engineer.
- Private company may do the operation of the plan, but not official yet. Private company doing water supply will most likely also operate wastewater. Fee set by the government.

- Confident that PPC will expand and O&M the infrastructure. Both rich and poor will be connected. Has identified.
- Added value of DSIF/Suez:
- OHS: Yes does a lot of training to protect international reputation. Invest in sub-contractors safety procedures and equipment, to make sure they comply. Regular checks and weekly safety meetings.
- Better quality of both equipment and project management. Compliance and transparent on what is delivered. Confidence is higher and compliance with specifications is higher. Vietnamese companies have lower contractual compliance.
- Pumping station has reserve capacity for phase 2.
- Other:
 - The client is not able to communicate in English and this cause problems esp. in the documents for designs and internal Suez documents -> delays. Technical terms are especially tricky as correct translation is important.
 - Has to fully follow local regulation can be problem for engineering work is a bit rigid and few have competencies in PPCs to review if in compliance with local regulation -> delays as they have to hire local consultants to ensure compliance with local regulation.
 - Local connections behind the fence should be done by local authority as it is sensitive for foreign contractor. But up for debate as it is currently up to Suez to do. O&M: After commissioning and training of company, not sure that they will be fully capable of 100% O&M. There should be a post-project TA support to O&M by Suez.
 - Suez had earlier a French loan for wastewater treatment plan (8.000 m3, finished 2017) only for the plants, no network.
 - The commercial contract was signed but awaited for a long time the signed loan agreement from Vietnam. This caused a significant delayed due to lengthy approval process of Ministry of Finance, Vietnam. Validity of contract was actually expired and there was a high risk of cancellation, but in the end the problem was solved. Contracted signed in 2018 but only in 2021 did implementation start. The scope much reduced: MFA approved in 2013 a project connecting 9.600 households, subsequently reduced to 6.000 and eventually only 1.400.

21.1.3 Interview with Mr Nguyen Van Ca Lo Anh, FIDIC engineer on Vi Thanh Wastewater and Sanitation project.

- Background of Mr. Nam - FIDIC for 30 months.
- Target of project is to run efficiently with sewers and household connecting. Improving environment and sanitation. And improve river cleanliness. 21.000 households will benefit. 11km of pipes. 1.398 HH will be connected. HH connection costs is a hot topic and Danida has agreed to pay with a grant for this construction inside. But for additional later HHs will have to pay.
- Why delay - Don't know only joined in 2019 but figures are outdated. Lot of modifications from contractor but approved with PMU and PPC. This also took time. PMU directors have also changed and few have ODA experience. Also causing delays.
- Benefits of use of int'l contractor (OHS equipment, life-costs) ODA projects bring a lot of benefits and high-quality pumps imported from EU with high standard and very durable. Management will be very professional. Good health, safety and environmental matters.
- Poverty profile: No discrimination but based on technical feasibility and cost effectiveness. Poor will also benefit both directly (connected) and indirectly (better general environment in the city).
- Health impact - Living standards will be better for sure and reduce diseases.
- Covid -19: Difficulties for main contractors to control the sub-contractors as the manager cannot get access to Vietnam.
- Sustainability Wastewater company is there but don't know how the plant will be managed, PPC will decided.
- Key recommendation: Keep set-up as such but speed up procedures and no delays. Also need PMU to be better experienced and less turn over.

21.1.4 Interview with Michael Brahe, Suez A/S 25 March 2021

Degremont Puretech now Suez for 14. Also in China and Sri Lanka. Vietnam is a challenge and all could have done better, but the project in Vietnam. Too long duration between feasibility and contract start so the budget was too low and even what was promised was not available. DSIF is a good tool for Vietnam also in helping finding projects. DSIF is also very slow not only Vietnamese authorities. Need higher proactiveness on DSIF side to identify projects.

Suez was not operating in Denmark between 2010 to 2015 as Suez HQ decided to close DK office. But Danida encouraged them to return. Projects are too small in Vietnam need to go bigger.

Monitoring consultant of Danida was new for Ba Don with much higher engagement from the monitoring consultant. Really working hard in monthly meetings but too frequent changes in monitoring consultants -> losing memory which is needed. However esp. in Vietnam it is needed as a referee when local authorities want to change contract. Vietnamese PMU have very limited powers to change minor specifications -> delays. Draw down period on loan expired and investment budgets expired so need new approval. Again resulting in delays. This is the case for both Ha Giang and Ba Don. Nobody has really understood how these ODA projects really works in Vietnam. Not enough local money. The project wastewater is not really supported locally and people block the work of Suez because they are not willing to pay or connect.

For Ba Dong many meetings with Embassy and authorities, but no impact. The sustainability is not well secured as Danida gets out of the way once the contract is in place. Also no insurance of connections and O&M. DK not able to pressure on Vietnam. The financials should have been secured upfront. Sustainability is compromised when focus is on budget squeezing.

21.1.4.1 Danish added value?

Good question, right technology and expertise. Has appropriate technology for educational standards. Not leaving the clients behind and will fulfil contracts no matter how difficult it has been. Local authorities will not accept equipment out of China. Also gives a status. Few conflicts or French or local designs as it is detailed in specifications.

21.1.4.2 Is Suez really Danish?

12 people working in Denmark. Office in Dk mainly for sales / execution where engineering work is in France, Spain and China. All engineering for Vietnamese done in China.

21.1.4.3 Vi Thanh Drainage and Water TP

Start 2018: Commercial contract signed. Awaits signed loan agreement. Delayed due to lengthy approval process of Ministry of Finance, Vietnam. Validity of contract has expired but is now starting and being designed. Not much to documentation after 2018. Suggest talking to employer the 'investment Project Management Unit of Hau Giang Province' and embassy but no field visits. John Sørensen from Niras.

Monitoring consultants: John (previous COWI) from Niras knows very well the context. SWECO has been struggling to learn the context. Niras has a good local monitoring consultant. FIDIC engineering has been forgotten in e.g. Ba Don but Danida decided to then to hire some FIDIC engineers. FIDIC engineers is a good tool. Should have been done from the beginning.

Danida grants help: Yes very useful and without grants no projects would have been possible. Grant directly to Suez otherwise it becomes too complex.

German training: Not much involved in this but know it has been Ba Don and Ha Gaing.