




















































Danish support to clean cooking and access to water in Africa through ESMAP

<p>Key results:</p> <ul style="list-style-type: none"> - Number of people provided with access to clean cooking (target: 350,000) - Number of additional World Bank / Multilateral investment catalysed by the Clean Cooking Fund (target: 10 investments) - Number of people provided with improved access to water (target: 700,000) - Private sector financing leveraged to provide sustainable water services (target: USD 7,488,000) - Enhanced climate resilience and improved health benefits - Gender targeted investments contributing to enhanced gender equality <p>Justification for support:</p> <ul style="list-style-type: none"> - Accelerate speed and scale to achieve progress towards SDG6 and SDG7. - Alignment with the Danish Government's long-term Strategy for Global Climate Action, as well as development policy signature priorities. - Access to clean cooking will help tackle indoor household air pollution, reduce Black Carbon emissions and reduce time spent on collecting firewood. - Access to safe, affordable and reliable water services is a fundamental human right, and will enhance the quality of life by reducing the time to collect water and contribute to improvements in human health, child education and economic productivity. <p>Major risks and challenges:</p> <ul style="list-style-type: none"> - Results may be affected by unpredictable field conditions beyond the private developers' control - Conflict over water sources - Competing priorities at the country level may constrain the ability to mobilize high-level political commitment and public financing. 	<p>File No.</p> <p>2021-10293</p>																					
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<p>Desk officer</p> <p>Morten Blomqvist/Tobias von Platen</p>																						
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<p>Relevant SDGs</p> <table border="1"> <tbody> <tr> <td> No Poverty</td> <td> No Hunger</td> <td> Good Health, Wellbeing</td> <td> Quality Education</td> <td> Gender Equality</td> <td> Clean Water, Sanitation</td> </tr> <tr> <td> Affordable Clean Energy</td> <td> Decent Jobs, Econ. Growth</td> <td> Industry, Innovation, Infrastructure</td> <td> Reduced Inequalities</td> <td> Sustainable Cities, Communities</td> <td> Responsible Consumption & Production</td> </tr> <tr> <td> Climate Action</td> <td> Life below Water</td> <td> Life on Land</td> <td> Peace & Justice, strong Inst.</td> <td> Partnerships for Goals</td> <td></td> </tr> </tbody> </table>	 No Poverty	 No Hunger	 Good Health, Wellbeing	 Quality Education	 Gender Equality	 Clean Water, Sanitation	 Affordable Clean Energy	 Decent Jobs, Econ. Growth	 Industry, Innovation, Infrastructure	 Reduced Inequalities	 Sustainable Cities, Communities	 Responsible Consumption & Production	 Climate Action	 Life below Water	 Life on Land	 Peace & Justice, strong Inst.	 Partnerships for Goals					
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Strategic Objective:

The strategic objective is to contribute with catalytic financing that provides speed and scale to increase access to water and clean energy in the context of SDG6 and SDG7 in Africa through innovative and pro-poor financing models.

Justification for choice of partner:

Denmark has been a long-term partner and main donor to the World Bank's energy programme ESMAP. The newly established ESMAP umbrella structure is an efficient way to provide financing targeted projects that accelerates access to energy and water in Africa.

Summary:

The Danish contribution will contribute to the Sustainable Development Goals, the objectives of the Danish Government's long-term Strategy for Global Climate Action as well as Danish Build Back Better and Greener approach in the midst of COVID-19. Both interventions support the ambitions of the Paris Agreement and will increase climate resilience, improve human health, lower carbon emissions, target poor rural communities through innovative business models and particularly benefit women and girls who often are responsible for cooking and fetching water and firewood.

Budget (DKK million):

Engagement 1 – Access to Water in Tanzania	41
Engagement 2 – Access to Clean Cooking	40,5
Engagement 3 – Programme Management	8,5
Total	90

Draft project Document

**Danish support to clean cooking and access to
water in Africa through ESMAP**

March 2, 2021

F2: 2021-10293

Draft project document for the Programme Committee Meeting on March 25 2021

Strategic Questions for the Programme Committee

This document constitutes a first draft version of the project document concerning the proposed Danish support to clean cooking and access to water in Africa through ESMAP.

Guidance is sought from Programme Committee on the following issues for the formulation of support:

1. The draft project document includes a proposal to support two different engagements through the World Bank's Energy Sector Management Assistance Programme (ESMAP) umbrella trust fund structure: i) The Clean Cooking Fund and ii) a solar-water pumping project in Tanzania.

Question: How does the Programme Committee assess this approach to project formulation and what potential issues should the formulation team be aware of moving forward?

2. The proposed project is expected to serve as a key deliverable to the enhanced Danish ambition to increase scale on access to clean water and sustainable energy in Africa in order to demonstrate progress towards the Sustainable Development Goals 6 (clean water and sanitation) and 7 (affordable and clean energy).

Question: Does the project sufficiently contribute to co-benefits derived from increased access to clean energy and water such as health, gender, jobs and economic development?

3. The proposed project is being developed at the same time as the new Danish strategy for development cooperation is under preparation.

Question: Does the Programme Committee consider that the project proposal lacks alignment with the expected strategic priorities in the new strategy development corporation?

Table of content

1. Introduction.....	5
2. The development challenge and institutional set-up	5
2.1. Water	5
2.2. Clean cooking	6
2.3. Institutional set-up and lessons learned	7
3. Strategic considerations and justification	8
3.1. Water	8
3.2. Clean cooking	10
4. Theory of change and key assumptions	11
4.2 Water	11
4.2 Clean Cooking.....	11
5. Strategic objectives and project components	12
5.1 Water	12
5.2 Clean Cooking.....	14
6. Expected results.....	15
7. Budget.....	16
8. Financial Management, planning and reporting	16
8.1 Water	17
8.2 Clean Cooking.....	17
9. Risk management.....	18
9.1 Water	18
9.2. Clean Cooking.....	18
Annex 1: Preliminary Context Analysis	20
Annex 2: Preliminary Partner Assessment.....	27
Annex 3: Preliminary Result Framework	29
Annex 4: Preliminary Budget Details	30
Annex 5: Preliminary Risk Management Matrix	31
Annex 6: List of supplementary materials	34
Annex 7: Plan for communication of results	35
Annex 8: Project Action Plan	36
Annex 9: Appraisal recommendation	37
Annex 10: Theory of change	38

1. Introduction

This draft programme document presents a proposal to support the Clean Cooking Fund in Africa and the private sector financing for rural solar-powered water supply project in Tanzania through World Bank's Energy Sector Management Assistance Programme (ESMAP) umbrella trust fund structure. The proposed Danish contribution of DKK 90.0million has a dual purpose of increasing access to modern cooking solutions and increase sustainable access to water. The Danish support will be key deliverables to the Danish Build Back Better and Greener approach in Africa, and specifically deliver on the enhanced Danish ambition to increase scale on access to clean water and sustainable energy in Africa. This will demonstrate direct progress towards the Sustainable Development Goals (SDG) 6 (clean water and sanitation) and 7 (affordable and clean energy) as well as benefit SDG 3 (healthy lives and wellbeing), SDG 13 (climate action) and SDG 5 (gender equality). The specific focus on access to clean cooking and water will contribute to reduce both women's domestic workload and exposure to health risks and gender-based violence.

Africa will face significant transformations and new challenges towards 2030 including rapid urbanization, climate change, environmental degradation and population growth. Further, the COVID-19 pandemic has resulted in increased number of people lacking access to clean energy and water. Failure to address these challenges poses significant risks, including pushing millions back into extreme poverty, climate change, health hazards and high morbidity from air and water pollution resulting in water borne and respiratory diseases. To build resilient, inclusive and sustainable societies, access to clean water and sustainable energy are critical building blocks.

The purpose of the Danish contribution is to provide catalytic finance to scale innovative technological and financial solutions on clean cooking and access to clean water. Both projects targets the poorest populations with a results-based approaches to deliver innovative and sustainable energy and water services. The projects also aim to leverage significant public and private financing to increase impact and sustainability of the project and demonstrate scalable private sector investment models. Both project would also provide significant benefits for women and children, and include significant health benefits. Project financing will be channeled through ESMAP's umbrella trust-funded programme, which allows making preferenced contributions to recipient-executed country projects and associated trust funds.

In sum, the Danish contribution to the two interventions will contribute to the Sustainable Development Goals, the objectives of the Danish Government's long-term Strategy for Global Climate Action as well as Danish Build Back Better and Greener approach in the midst of COVID-19. Both interventions support the ambitions of the Paris Agreement and will increase climate resilience, lower carbon emissions, target poor rural communities through innovative business models and particularly benefit women and girls who often are responsible for cooking and fetching water and firewood. Further, the intervention on water is aligned with the Tanzania National Water Policy and improving access to water is critical in the fight against COVID-19 and protecting human health.

2. The development challenge and institutional set-up

2.1. Water

Access to water, sanitation and hygiene (WASH) is a human right, yet hundreds of millions of people in Africa are have no access to even the most basic of services. In 2020, global progress towards meeting SDG6 has

been jeopardized by COVID-19 pandemic, which has also had severe impacts on WASH services in Africa. The pandemic threatens to roll back years of hard-won development progress towards delivering on SDG6 and water-related SDGs. Provision of safe water and sanitation is a critical tool for protecting human health during all infectious disease outbreaks, including COVID-19. The COVID-19 crisis has exposed the large inequalities of access to water across the globe and highlighted the critical need for water to not only prevent the spread of the disease, but also to revitalize economies, employment opportunities, health outcomes, and the environment.

In Sub-Saharan Africa, 42% of people are without a basic water supply, and 72% without basic sanitation. There are two fundamental reasons for this. First, frequent breakdowns of rural water systems, and second, high capital and operational costs. A World Bank study suggests that at least 30% of Community-based Water Organizations with pumping systems powered by a diesel generator are not financially sustainable. Evidence also suggests that about one-in-five newly constructed water schemes breakdown within the first few years often due to financial constraints. Prices for the solar panels used for water pumping systems have dropped by approx. 80%. In addition, these panels last around 25 years, requires little maintenance and does not depend on expensive and unreliable diesel supplies. The challenge is, however, that it requires a higher up front cost and better regulation to ensure a sustainable consumption level.

SDG 6 calls for universal access to water and sanitation by 2030 – a formidable challenge for Tanzania where UNICEF/WHO in 2017 found rural access to basic water supply and sanitation at 42.5% and 23.5% respectively. The proportion of the population with basic access to water and sanitation is significantly lower in the rural areas compared to urban areas. In 2006, Tanzania launched its ambitious Water Sector Development Program (WSDP) for 2006-2025, encompassing the entire water sector, from water resources management (WRM) to urban and rural water supply and sanitation. Reaching universal access means not only providing full water access to the population, but also ensuring a continuous supply of sufficient, affordable and clean water. This has proven to be especially challenging for rural water supply. In 2016, the World Bank's Implementation Completion and Results Report for WSDP-1 found that "achieving sustainable rural water service delivery continues to be a major challenge." Lessons from implementation showed that there is a need to consider different management and financing models and technologies that can address the shortcomings of the community driven approach as well as the growing financing gap in the sector.

Tanzania's water stress is exacerbated by climate change. Climate change is increasing spatial and temporal variations in rainfall, and temperatures are rising (with a projected increase of 2-4 degrees by 2050). This is likely to increase aridity and water scarcity. Future trends in rainfall are highly uncertain, as model projections do not agree on whether rainfall will increase or decrease in Tanzania. However, even now, climate change is aggravating water scarcity and further degrading water quality as the rise in temperature increases aridity.

2.2. Clean cooking

More than 900 million people, or around 85% of the population in Sub-Saharan Africa, lack access to clean, safe, affordable and reliable cooking energy. Instead they rely on traditional and polluting fuels and technologies for cooking, exposing particular women and children to household air pollution which leads to nearly 700,000 premature deaths annually in Sub-Saharan Africa due respiratory diseases and infections. Both the the annual welfare losses from the health impact and human consequences are staggering. On the positive side, recent trends in indicate increased political commitment to address the clean cooking challenge

and new technologies and business models are emerging. New solutions to tackle the clean cooking challenge must prioritize user preferences and local cooking contexts to address longstanding barriers to the adoption of modern cooking solutions. Though there is no technological quick-fix for clean cooking as it depends on local consumer behavior, there is a momentum to act.

Support to clean cooking will target important areas of climate, gender and health impacts. Lack to clean cooking fuels and technologies - such as improved cook stoves, electric cookers and clean fuels, e.g. electricity, biogas, ethanol, solar and biomass pellets - result in severe health, gender, economic, environmental, and climate impacts. Household air pollution (HAP) from cooking with traditional solid impacts particularly the health of women and children, where more than half of premature death are children under the age of five. The annual global welfare losses from the health impact alone is estimated by the World Bank at a staggering US\$1.52 trillion. Much of women's unpaid work hours are spent on fuel collection and cooking, totaling 140 million potentially productive person-years. Greenhouse gas (GHG) emissions from nonrenewable wood fuels for cooking amount to a gigaton of CO₂ per year; about 1.9-2.3% of global emissions (Bailis et al. 2015). In addition, the burning of residential solid fuels accounts for up to 58% of global black carbon (BC) emissions and approximately one-third of wood fuels is harvested unsustainably leading to environmental degradation and vulnerability to climate change and ultimately communal resource-based conflicts.

2.3. Institutional set-up and lessons learned

Denmark has been a long-term partner and main donor to ESMAP. Denmark provides both core funding to ESMAP but has also provided preferenced funding to specific areas of ESMAP's work or associated trust funds. This includes preferenced funding to the Mini-grid facility and the Energy Subsidy Reform Facility but also the associated such as the trust fund SIDS DOCK targeted small island states. The current Danish contribution to ESMAP's Business Plan is also divided between core funding and 'preferenced' funding to specific areas of the Business Plan, including access to energy and clean cooking.

Together with the adoption of the new Business Plan in June 2020, ESMAP also became the "umbrella" trust-funded program of the World Bank's energy practice. Through the "umbrella", ESMAP would provide donors with the option to make "preferenced" supplemental contributions to specific recipient-executed country/regional grants (RETFs). While ESMAP will continue to mobilize core funding for their business plan, it has an ambitious target to also mobilize funding for client executed projects and associated funds. As a member of the Consultative Council, Denmark has supported this new possibility of targeting more resources to specific thematic areas and enhance links to project implementation. In practice, it means that it will be easier to co-finance IDA-projects and associated trust fund under the ESMAP umbrella. This structure will also allow ESMAP to mobilize co-financing for priority areas from Green Climate Fund and Climate Investment Funds.

In this way, the ESMAP umbrella structure is an efficient way to provide financing targeted projects that accelerates access to energy and water in Africa. One part will be preferenced as support to the Clean Cooking activities in Africa. This associated trust fund to ESMAP is integrated in ESMAP's 2021-2024 Business Plan and results framework. ESMAP has confirmed that the new umbrella structure allows it to make preferenced funding through ESMAP to World Bank country projects, and by this, avoiding setting up complex bilateral supported trust funds.

3. Strategic considerations and justification

The Danish contribution via ESMAP to clean cooking and solar-water pumps in Tanzania will aim to scale interventions towards achieving SDG6 and SDG7. It will demonstrate Danish efforts to target the poorest population and a targeted effort to leave no-one behind. It also contribute to walk-the-talk related to the Danish commitment to be Global Theme Champion for SDG7 and it is aligned with the Danish Government's long-term Strategy for Global Climate Action. It also contribute to achieving the target of providing access to clean energy and water for 5.8 million people Africa, which was announced by the Danish Minister for Development Cooperation in October 2020. The contribution illustrates the close links between delivering on SDG6 and SDG7 and improved health conditions and broader climate action.

COVID-19 has underscored the importance of providing access to water and clean energy. With the support to the projects, Denmark will support an effort to Build Back Better and Greener. The dual objectives of the Danish support will provide leapfrogging technology based on renewable energy and combined with innovative business models to reach the poorest populations in Sub-Saharan Africa, and by this support an inclusive development that does not leave any-one behind.

Despite the differences in scope and operating models, the common target for both projects is to provide speed, scale and financing to achieve the SDG6 and SDG7. This is done by:

- *Mobilization of private financing in Africa:* Use Danish development assistance to leverage public and private financing in scalable blended financing and results-based financing mechanisms to achieve speed and scale on investment in water and clean cooking.
- *Build Back Better and Greener:* Support innovative business models and technological solutions to increase climate resilience, reduce carbon emissions and strengthen environmental management. By this, provide access to affordable green technologies and solutions to access water and clean cooking. .
- *Gender and leaving no-one behind:* The projects will mainly target rural poor household in low-income countries in Sub-Saharan Africa, particularly benefitting women and girls,

The Danish contribution will also seek to build synergies to both bilateral and multilateral support. This will be done through overall Danish work with SDG6 and SDG7 both at the bilateral level through relevant embassies and at the multilateral level. Specifically, the two interventions will demonstrate innovative approaches and enable economies at scale to leverage additional financing to clean cooking and water with a specific focus on long-term sustainable results. Further, new business models and technology will be tested, and lessons learned with relevant multilateral and bilateral partners will be considered. The specific project sites are not known at this stage, which requires a flexible and adaptive approach to the management of the project. An adaptive management approach will therefore be applied with a focus on continuous learning from project implementation and on achieving the greatest possible impact.

3.1. Water

Access to safe, affordable and reliable water is paramount in the pursuit for human well-being and strengthen climate resilience. Bringing higher quantities of safe reliable water to households will enhance the quality of life by reducing the time and effort to collect water and through improvements in human health, child

education and economic productivity. Improvement of health and well-being of the poorest is one of the Danish country policy strategic objectives for Tanzania.

Stunting is a predictor of many developmental constraints, including cognitive deficits and loss of future economic opportunities. The effects of stunting are permanent; when stunted children become adults they are likely to earn 20% less than their peers. Some estimate the overall GDP losses from stunting at 4–11%.¹ Recent evidence suggests that poor sanitation is the second leading risk factor for child stunting worldwide² and that diarrhea and chronic environmental enteropathy (intestinal inflammation) in children are linked to a lack of sanitation and have a significant impact on childhood development.³ Up to 43% of stunting may be due to gut infections caused in part by poor water, sanitation, and hygiene.⁴ Chronic undernutrition rates, as measured by stunted growth, are high, affecting one in three children under five years. Tanzania has successfully reduced death rates in younger age groups and surpassed the former Millennium Development Goal related to child mortality. However, chronic undernutrition in Tanzania is the third highest in Sub-Saharan Africa, affecting an estimated 2.7 million children or 35%

Gender gap. Improved access to water has substantial positive gender impact. Despite the Government of Tanzania's efforts to promote gender equality, women are less likely to participate in the labor force than men and those who do participate experience higher unemployment rates than men. In rural communities, women and girls are typically responsible for collecting water and are, therefore, disproportionately affected when water sources are remote or do not function properly. It is evident, that adequate sanitation and menstrual hygiene management increase adolescent girls' retention and participation in schools in Tanzania.⁵ Considering that only 52% of the eligible student population is enrolled in lower secondary schools, it is important to promote adequate conditions both in schools and at home, especially for girls, to attain education.⁶

Climate change and water supply. Tanzania has a complex landscape with high spatial climate variability, from tropical at the coast to temperate in the highlands, and two predominant precipitation regimes with an average annual rainfall of 600–800 mm. The economy is increasingly affected by prolonged droughts, severe storms and floods, and rising temperatures. Disadvantaged socioeconomic groups are disproportionately affected by climatic conditions and resort to various adaptation practices and coping strategies, including diversification of their production and livelihoods. In addition, trade-offs in natural resources use are increasing with pressure from population growth and economic development, affecting key ecosystem services such as water production and timber, on which rural communities depend. The project has been designed to build resilience against local climate risks, including drought. Climate change adaptation measures will include switching rural villages from seasonal to permanent water sources.

¹ Horton, S. and R. Steckel. 2013. "Malnutrition: Global Economic Losses Attributable to Malnutrition 1900–2000 and Projections to 2050." In *The Economics of Human Challenges*.

² Guerrant, Richard. 2012. "The Impoverished Gut—A Triple Burden of Diarrhea, Stunting and Chronic Disease." <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3617052/>.

³ Petri, Naylor, Haque. 2014. "Environmental Enteropathy and Malnutrition: Do We Know Enough to Intervene?" *BMC Medicine*.

⁴ Goodarz, Danaei. 2016. "Risk Factors for Childhood Stunting in 137 Developing Countries." <http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002164>.

⁵ World Bank. 2015. "Preparing the Next Generation in Tanzania: Challenges and Opportunities in Education."

⁶ United Republic of Tanzania, Ministry of Education, Science and Technology. 2016. "National Guideline for Water, Sanitation and Hygiene for Tanzania Schools."

Population Growth: The majority of the population rely on agriculture for their livelihood and the economy is highly dependent on natural resources, including water. Tanzania has experienced an exceptionally high population growth, from 11 million in 1963 to over 58 million in 2019. Tanzania’s current annual population growth rate stands at about 3% due to the persistently high fertility rate at five births per woman. At the current growth rate, the population is projected to exceed 100 million by 2040.⁷ This drastic demographic change poses an extraordinary challenge to the water sector as Over 80% of poor and extremely poor Tanzanians live in rural areas and depend on natural resources-based livelihoods and subsistence farming. Tanzania not only will have to expand and sustain water service to the current unserved population but also catch up with the rapidly increasing rural population.

Water stress and conflict: Tanzania has become water stressed. Over the last 25 years Tanzania’s freshwater resources per person have dropped from over 3,000 m³/capita/year to around 1,600 – beneath the water stress threshold of 1,700 m³/capita annually. Over the same period the size of the economy has tripled, and formal and informal irrigation has expanded, all of which rely on increasing use of already over-stressed water resources. Water demand has exceeded dry season supply by up to 150% in some areas. As drought become more common so does conflicts over water, which has seen a rapid increase in the dry season. Improving year-around access to water may alleviate local conflicts.

3.2. Clean cooking

Clean cooking is key to achieve SDG 7 but it also has multiplier impact for making progress across a range of other Danish priorities. Universal access to clean fuels and technologies for cooking is one of the targets under the SDG 7, which calls for ensuring “access to affordable, reliable, sustainable, and modern energy for all” by 2030. It has been widely recognized that cooking solutions are also critical for achieving other SDGs, including good health and well-being, gender equality, climate action, and poverty elimination.

Lack of clean cooking is a health emergency. The Danish contribution will provide urgently needed funding and international political support to tackle indoor household air pollution which is responsible for 4.3 million premature deaths per year. The health impacts are unevenly distributed, with women and children bearing the largest burden. Further, there is also urban-rural discrepancies to access to clean cooking fuels and technologies, where a much higher proportion of rural households rely on polluting cooking technologies and fuel.

Targeting gender challenges. Empirical evidence shows that women and children in developing countries can spend up to 10 hours a week gathering fuel, and this time poverty has detrimental impacts on access to education and income-generating opportunities. Reducing the time and effort spent on this unpaid work could help in equalizing wage-labor participation rates, potentially shrinking income gaps between women and men. They also bear the risks of gender-based violence (GBV) during fuelwood collection; and intimate partner violence from delayed or poorly cooked food.

Climate benefits. Residential burning of solid fuels contributes up to 58% of global Black Carbon emissions and 1 gigaton of carbon dioxide equivalent (CO₂e) emissions per year, making it second largest contributor

⁷ UN Population Division. 2017. “World Population Prospects.” <https://esa.un.org/unpd/wpp/>.

to climate change⁸. Further, burning and collection firewood in semi-arid areas also contributes to rapid deforestation and ecosystem degradation. Approximately one-third of woodfuels is harvested unsustainably leading to environmental degradation and vulnerability to climate change and ultimately communal resource-based conflicts.

Need for high-level political commitment. There is an increasing acknowledgement of clean cooking lacking high-level political commitment. By supporting the Clean Cooking Fund, Denmark is demonstrating political leadership on SDG7 with a handful of other international donor countries. Clean cooking is an orphaned area which does not receive much political and financial attention. It is estimated that without additional efforts, it is estimated that additional 475 million people will have no access to modern cooking solutions in SSA by 2030. This means that almost 50% more people in Sub-Saharan Africa would lack access to clean cooking.

4. Theory of change and key assumptions

4.2 Water

The purpose of this project is to ensure increased sustainable access to rural water supply to households, health clinics and schools and thereby contribute to the improvement of the quality of life of the target groups by reducing the time and effort to collect water, protection of human health and enhance gender equality. The project aim to achieve this objective by supporting the following four main results areas: i) Improving the technical sustainability (reduce breakdown) of rural water schemes; ii) Improving financial sustainability; iii) Facilitating the rehabilitation of old rundown rural water supply schemes; and iv) scaling blended private sector financing mechanisms in the rural water supply sector through Public Private Partnerships.

Key Assumptions: The overarching assumption is that rural dwellers has a willingness to pay for safe water. Based on surveys and data collected across thousands of rural villages in Tanzania TZ50 (USD 0.02) per 20 liter is an acceptable rate. The Project will use the current community water tariff. The solar power will reduce the water extraction costs and the pre-paid meters will increase the revenue collection efficiency, which in the longer term should enable a lower water tariff.

4.2 Clean Cooking

The purpose of setting up the CCF is to mobilize political commitment, learning and funding to scale up access to clean cooking by using introducing improved cook stoves new cooking methodologies and using renewable energy, electricity or biogas or improved alternative fuels, including ethanol, briquettes, and pellets. The fund measure its impact by the increased number of people in client countries with access to clean cooking. Achievement of this outcome is also expected to lead to reduced greenhouse gas (GHG) and black carbon (BC) emissions, better health with HAP-related diseases averted, and greater gender equality. The theory of change is outlined in annex 10 and illustrates how key sector challenges are addressed by the activities under the two overall pillars and their components, and how these then lead to intermediate outcomes and ultimately the program's overarching goals. The Results Framework for the CCF follows this structure,

⁸ Black carbon particles, the major constituent of soot, absorb solar radiation and thus in the air heat the atmosphere. It has been estimated that black carbon is the second most important pollutant, after carbon dioxide, contributing to climate change.

providing program- and pillar-level outcomes and indicators, with each funded country-level activity having its own Results Framework linked to it.

Key assumptions: The underlying assumption for the clean cooking fund is that international political attention and funding can push new political commitment to overcome the limited progress observed today. This can be done by sharing lessons learned, increase concrete political commitments, provide grants as economic incentives to overcome economic barriers, increase awareness among end-users and build innovative business models to promote new technology.

5. Strategic objectives and project components

5.1 Water

The solar water pump project in Tanzania aims to create sustainable rural community-based water supply through a transition to solar pumping with reduced operating expenditures. By this, thousands of diesel-powered water schemes currently in operation in rural areas in Tanzania can be transformed to cheaper, more robust and less polluting water schemes. The community-based solar water-pumping project offers a unique intersection of blended financing and emerging digital technologies in rural water service provision. It has been the first to involve the private sector at scale to install and maintain the PVP (solar) systems, including the pre-paid meters and mobile money. Through a cluster-based approach and performance-based service contracts, the objective is to enhance safe water access through schemes rehabilitation, increase service reliability through private sector involvement, increase revenues and reduce operating expenses (OPEX).

This project builds further on recent innovative initiatives in rural Tanzania and seeks to introduce the following elements to address Tanzania's barriers to the achieving the SDG 6:

- Introduce a scalable blended financing mechanisms for rural water supply
- Facilitate a scaled technology shift to solar water pumping
- Introduce water treatment (chlorination) to reduce stunting
- Facilitate a scaled technology shift to pre-paid mobile money enabled water meters
- Introduce remote monitoring technology at scale
- Increase the private sector involvement for service and maintenance of rural water supply schemes
- Demonstrate whether the water tariff in rural communities can finance reusable sanitary pads

The project will seek to consolidate and build on the achievements of the ongoing World Bank Accelerating Solar Water Pumping via Innovative Financing Project (2019-2021), which is an effort to move the sector from solely relying on grants. The Nordic Development Fund financed a previous project, which informed the design of the current project. The project combines debt financing and output-based subsidies to reach poor communities in rural Tanzania and take an important step toward leveraging private sector financing. In fact, the project is the first attempt to leverage private sector financing at scale in Tanzania's rural water sector. Compared to the ongoing first phase of the project this new phase will contribute to value-added on the following:

1. Moving from a "pilot financial arrangement" to a formal PPP structure
2. Moving from 4 year loans to longer term 10-15 year loans/concessions which opens up for much more scale
3. Moving from tenders with 50 villages to 200-500 villages per lot (more economies of scale)
4. Increased the responsibility and risk taken by the private sector
5. Moving from the current 40% private sector financing to above 60%

Project components:

1. **Component 1 – Investments in water infrastructure:** The proposed investment includes a solar pumping system, remote sensors, water treatment, smart water meters, rehabilitation of any existing water infrastructure and a 10-15 years service agreement. The average cost of a solar pumping system is estimated at US\$60,000, of which the DANIDA Grant based subsidy will cover approximately US\$ 24,000 (40%). US\$ 36,000 (60%) and the Project Companies will bear the remaining through the 10-15 years concession. These estimates are based on the procurement carried out by the project in late 2020 for 110 sites across five regions of Tanzania. In aggregate terms, the Danish contribution of approximately US\$ 5 million and US\$ 36,000 per Solar Pumping (PVP) System that is covered under 40% CAPEX subsidy, the grant expects to result in 218 new PVP systems in rural Tanzanian villages or small towns. It is important to note that the cost include a 10-15 year service agreement (concession) with the Project Companies, which has been factored in the CAPEX estimate. Criteria for selecting sites for investments include: i) rural area; ii) high poverty levels; iii) high level of none-revenue water; and iv) location of health clinics and schools.
2. **Component 2 – Feasibility Study, Extensive Community Consultation and Gender:** This component covers the cost of identifying, surveying (Feasibility studies) every targeted site including extensive engagement with communities and local government stakeholders. It is important to highlight the extensive consultations required to sensitize regional, district and village-level stakeholders including politicians and traditional leaders in a quasi-socialistic environment that on large-scale private sector involvement. This was done successfully under the World Bank’s “Accelerating Solar Water Pumping via Innovative Financing Project” but required adjustments and additional efforts on the way. Component 2 will also implementation support cost, administration, supervision and hand-holding on advanced procurement and potentially PPP. Lastly, Component 2 will fund the Gender subcomponent described below.

Gender subcomponent: A global Menstrual Hygiene Management Vision: *By 2030, “Every woman and girl has the information, supportive environment, menstrual products and infrastructure to manage her period safely, hygienically, with confidence without shame, at home and away from the household, including in emergency situations”*⁹ One of the main barriers in achieving this vision is the lack of liquidity to purchase products for the bottom of the pyramid female population. The project seeks to solve this challenges by:

- I. **Introducing a proven technology** for female sanitary pads that is inexpensive, reusable, washable and contains a permanent self-sanitizing antimicrobial treatment that effectively reduce fungi and bacteria

⁹ Source: Sommer M, Caruso B, Sahin M, Calderon T, Cavill S, Mahon T, Phillips-Howard PA. A time for global action: addressing girls’ menstrual hygiene management needs in schools. PLoS MED: 13(2) e1001962, 2016.

during use and after washing, even if contaminated water is used. The technology should last the user at least 12 months and preferably up to 2-3 years. The product should have the capacity to prevent vaginal infections, infertility and be made from highly absorbent material providing a comfortable and hygienic experience for women and young girls and may in turn reduce school drop-outs and work absenteeism.

- II. **Financing:** The project will through a subsidy or equivalent incentive the targeted villages to sign a long-term service agreement with a vetted private sector provider for the abovementioned technology. The service agreement will include training and supply of products for the entire female village population requiring this product. The products and service will be financed through the water tariff. It should be noted that the Project through reduced cost of water extraction and increased revenue collection will generate a significant net profit for the Community-Based Water Supply Organization (CBWSO) that will make this arrangement possible. Most CBWSOs currently have gender balance (50%) as per the policy.

PPP Approach: The PPP approach is planned to include 10-15 years concessions for design-build-operation-transfer contracts for rural water schemes. To enable economies of scale, each lot will include a cluster of 200-500 rural villages with voluntary participation. The project companies will invest and rehabilitate rural water schemes and recoup the majority of the investment through revenues from water sales. The majority of the Danish funding, will be used to subsidize the PPP to make the investment profitable for the private investor. The competitive process will award the concession to the qualified bidder requesting the lowest subsidy. The exact PPP structure will be determined through a feasibility study.

5.2 Clean Cooking

The ESMAP-managed Clean Cooking Fund (CCF) is established in close collaboration with other multilateral agencies, and aims to create a paradigm shift to raise high-level political commitments that can scale up public- and private-sector investments in the cooking sector. The dedicated CCF will co-finance and leverage concessional finance from the WBG and other MDBs, primarily utilizing Results-Based Financing (RBF) approaches to incentivize the private sector to invest, innovate, and deliver impacts in the sector. If successful, investing in clean cooking could potentially save millions lives a year, reduce GHG emissions and can often free up substantial time that f women’s time spent collecting fuelwood.

The aim of the Fund is to deliver modern cooking services primarily through results-based funding grants and is expected to leverage at least US\$ 2 billion in investments over the next five years. Innovative companies leveraging on the growing penetration of mobile networks and digitalization have also started providing energy services on a pay-as-you-go (PAYG) basis, thus widely overcoming the affordability barrier. Moving forward, incentive schemes and innovative business models will need to be further developed, adapted to local conditions (noting in particular the strong disparity between urban and rural contexts) and applied to a wider range of fuels and technologies.

The Clean Cooking Fund is building a multilateral partnerships to achieve a momentum and high-level political commitments. The fund will also support and complement a High-Level Coalition of Leaders for Clean Cooking, Energy, and Health which is being convened by the World Health Organization (WHO), the United Nations Development Programme (UNDP), the United Nations Department of Economic and Social Affairs (UNDESA), and the World Bank under the Health and Energy Platform of Action (HEPA) to create the necessary political momentum for clean cooking solutions.

The Clean Cooking Fund (CCF) has been established as an innovative fund with the goal of accelerating progress toward universal access to clean cooking by 2030. CCF aims to mobilize political commitment and financing to attract private-sector and multilateral investments in the clean cooking sector. Further, it will catalyze technology and business innovations across the clean-cooking value chains, and link incentive payments with verified results by increasing number of households connected with clean cooking technology and fuel which again will results in improved health, gender equity and reduced carbon emissions. The fund is divided in two overall pillars:

- **Pillar 1: Country investment programmes:** The CCF will co-finance multilateral investments and scale up public and private investment in the clean cooking sector. Pillar 1 will primarily use Results-based grants to pay for the verified output, outcome, and impact results. As a minimum, CCF will require at least 1:1 leverage of World Bank/MDB financing for the country/regional investment projects. The focus of the interventions will be to build an enabling environment for clean cooking, increase an access to commercial finance for enterprises and businesses, catalyze technology and and business innovation across the clean cooking value chain, and to provide results-based grants for the public goods currently under-delivered due to the affordability gap. To underscore the ambition of scale, the investment size of each project is expected to be at least US\$20 million where at least 50 percent is co-financed by the MDBs. If CCF can mobilize USD 100 millioner, it expected that Pillar 1 can leverage at least US\$1 billion in additional investments for the sector. In addition, the pillar is complemented with component provide capacity building, technical assistance and support for project preparation. An initial pipeline of IDA projects is ready to utilize the CCF once it is operationalized, incl. projects in Rwanda, Burundi, Ghana, Uganda, and Zambia
- **Pillar 2: Global Platform for Knowledge, Innovation, and Policy Coordination.** This pillar will work with development partners to mobilize high-level political commitment at both the global and country levels and increase knowledge, innovation, and policy coordination. Multi-stakeholder partnerships and platforms are necessary to “change the game” on clean cooking. The component will provide resources to United Nations agencies and key partners to enhance partnerships for global outreach, knowledge dissemination, and policy coordination. More specifically, the CCF will work jointly with the Health and Energy Platform of Action (HEPA) and directly support establishment of the High-Level Coalition of Leaders for Clean Cooking to be comprised of heads of state or ministerial-level representatives. It will create a knowledge platform for publishing and sharing analytical products, promoting cross-country learning and exchange, and regularly taking stock of knowledge gaps and opportunities. The knowledge platform will draw on the successful experience from Lighting Global on access to electrification, incl. promotion of business models that can deliver services to unserved households. There will also be an innovation fund which will support technological, business, policy, social, and financing innovations that closely align with the country/regional programs.

6. Expected results

Separate results-framework will be established for the two projects.

- **The private sector financing for rural solar-powered water supply project aims** to provide 700,000 rural residents with basic access to sustainable water services through improved solar water pumping systems. The project only targets rural off-grid villages with a functioning water scheme powered by

a diesel generator. The village water committee (CBWSO) will sign the loan agreement and have their pumping systems hybridized with solar power, meaning that the pump can run both on solar and the diesel generator. The water infrastructure will be financed by a 60% subsidy covered by the Danish contribution and 4-year loan from the Tanzania Development Bank (11% interest rate) to the CBWSOs. The approach is for the villages to use their savings on diesel fuel to repay the loan covering 40% of the CAPEX.

- **The Danish contribution to the Clean Cooking Fund** is estimated to contribute to providing approximately 350.000 people with access to clean cooking. This will be done by providing co-financing and economic incentives that can establish an enabling investment environment for clean cooking and a Results-based Payment scheme for verified output, outcome, and impact results. To avoid sporadic and piecemeal interventions, the investment size of each country/regional project is expected to be at least US\$20 million; where 50 percent of the financing will be provided by multilateral development banks and funds. The Danish contribution will be targeted Africa and the Uganda-project is expected to be a main beneficiary of the Danish grant and used as a proxy indicator to monitor the number of people benefitting from accessing clean cooking.

7. Budget

The funding to the two projects will be channeled through ESMAP. It is the anchor multi-donor trust fund for the World Bank energy practice and follows the new and more flexible 'Umbrella 2.0 program' for trust funds. This means that ESMAP can channel core, preferred and earmarked funding to own activities but also to associated trust funds and to recipient executed country-specific trust funds. In this new administrative context, ESMAP expects to be able to mobilize more funding. The Danish funding will be allocated as grants to the two projects and used to leverage additional capital and subsidize costs to bridge the affordability gap where it is needed.

Indicative overall budget	DKK (million)	USD
Engagement 1: Access to water in Tanzania		
Outcome 1.1: Investment in water infrastructure	35.00	5.75
Outcome 1.2: Feasibility Study, Extensive Community Consultation and Gender	6.00	1.00
Engagement 2: Access to clean cooking		
Output 2.1: Clean cooking country investments in Africa	36.45	5.99
Output 2.2: Global knowledge and innovation	4.05	0.67
Programme management		
Management fee (5%)	4.5	0.74
Contingencies (5%)	4.0	0.66
TOTAL	90.00	14,80

USD exchange rate (February 25, 2021): 6.0815

8. Financial Management, planning and reporting

The World Bank accepts the contributions on behalf of the ESMAP, according to its policies for acceptance of external funds, normally in cash under trust fund agreements between the donor and the World Bank.

Accounting, auditing and reporting will be undertaken in accordance with the Administration Agreement between ESMAP and the World Bank Group. ESMAP will provide access to current financial information

relating to the trust fund, in the holding currency of the trust fund, and an annual single audit report within six (6) months following the end of each Bank fiscal year.

The audit report should comprise (i) a management assertion together with an attestation from the Bank's external auditors concerning the adequacy of internal control over cash-based financial reporting for trust funds as a whole; and (ii) a combined financial statement for all cash-based trust funds together with the Bank's external auditor's opinion thereon. The cost of the single audit shall be borne by the Bank. The Bank will make available copies of all financial statements and auditors' reports received by the Bank from Recipients pursuant to any Grant Agreements in accordance with the Bank's Access to Information Policy.

ESMAP produces an annual narrative and financial report demonstrating progress of the results framework indicators and targets. The narrative report is presented to the Consultative Group for comments before final submission. Results on relevant selected indicators will be reported to the Danish public through Open Aid. A joined external mid-term review and final evaluation is also planned. The TAG will provide external advisory to the mid-term review and final evaluation.

Funds from Denmark to the ESMAP will be disbursed once per year, following the CG's approval of the previous year's annual report and accounts, with a foreseen annual disbursement of DKK 22.5 million between 2021 and 2024.

The Danish Ministry of Foreign Affairs reserves the right to carry out any technical or financial mission that is considered necessary to monitor the implementation of the program. After termination of the program support, Denmark reserves the right to carry out evaluation in accordance with this article.

8.1 Water

The Rural Water Supply and Sanitation Agency (RUWASA) will be the lead implementing agent with support from the Ministry of Water, the Government's PPP Desk and tentatively TIB Development Bank (Tanzania Development Bank). The World Bank Group's International Finance Corporation (IFC) may provide Advisory and Investment support if feasible. RUWASA is a newly established agency responsible for the development and sustainable management of water supply and sanitation projects and water service delivery in rural areas. The agency has been established by the new Water Supply and Sanitation Act No. 5 of 2019. The agency is working under the Ministry of Water and it was inaugurated on July, 2019. RUWASA has regional and district level offices and works closely with local government agencies and communities especially the village-level Community-Based Water Supply Organizations (CBWSOs).

The project will be implemented through a combination on World Bank Executed Activities and Client (Government) Executed Activities. Component 1 will be implemented by RUWASA and while most of Component 2 will be implemented by the World Bank. A Project Coordination Group will be established between all the implementing agencies and a coordination meeting will be held bi-weekly.

8.2 Clean Cooking

The CCF will be established and managed by ESMAP as a dedicated global program. The CCF will therefore be able to fully utilize ESMAP's well-established governance structure and management and operation systems to reduce administrative costs and increase efficiency and effectiveness.

ESMAP is governed by a Consultative Group (CG), consisting of representatives from contributing donor governments and chaired by the Senior Director of the World Bank's Energy and Extractives Global Practice. The CG makes decisions by consensus and meets at least once a year to provide feedback and guidance on ESMAP's strategic direction, achievements, use of resources, and funding priorities.

All CCF donors will automatically become ESMAP donors and be invited to join the CG. There will be a dedicated session during the CG meetings to discuss CCF operations. A dedicated Technical Advisory Committee (TAC), consisting of key development partners and international experts, will be established for the CCF to provide recommendations on its strategic direction and priorities.

Results reporting will form part of ESMAP's annual report and dedicated annual thematic reporting which is integrated in ESMAP's Business Plan for World Bank Fiscal Year 2021-2020

9. Risk management

ESMAP complies with the World Bank's administrative, operational, and fiduciary capacities, including policies to safeguard against corruption, fraud and adverse social and environmental impacts.

In practice, this means that the ESMAP risk management is integrated in the overall World Bank Risk Framework. The Risk Framework pillars include the Systematic Operations Risk-Rating Tool (SORT), which rates eight dimensions of risk (Environment and Social; Fiduciary; Institutional Capacity; Macroeconomic; Political and Governance; Sector Strategies and Policies; Stakeholders; and Technical Design). Rating is divided on a four-point scale (high, substantial, moderate or low) depending on the likelihood that risk will materialize and the expected severity of its impact if it does materialize.

ESMAP has established its own risk management framework divided between strategic and operational risks (see annex 5). The risk matrix highlights relevant risk such as ESMAP not responding to client needs, duplication with existing activities and ESMAP support not reaching vulnerable population, e.g. in fragile environments. The risk matrix will be discussed annually within the Consultative Group.

As a donor, Denmark considers ESMAP to have solid risk mitigation measures in place and the overall risk rating is considered low. The Danish risk management will therefore focus on specific key contextual, programmatic and institutional risks for the Business Plan period.

9.1 Water

The main risks include: i) change of political support for PPP transactions; ii) conflict over water sources; and iii) underperformance of the private sector. It is anticipated that the private operator will bear a large portion of the operational risk. However, the risk will be borne by the party that is best able to manage them at least cost. The main risk is the Government's willingness to participate in a PPP-like scheme.

9.2. Clean Cooking

Given the complexities of the clean cooking sector and the interplay between environmental, health, social, and economic benefits, the CCF is considered a high-risk, high-reward initiative. Reducing and managing risk will require that the World Bank and its CCF partners design realistic activities and interventions that can be implemented within the life span of projects and measured using concrete indicators that can be easily monitored.

Specifically, there is a lot of competing priorities or interests at the country or sector level may constrain the ability to meet the Clean Cooking Fund's objectives for transformative interventions. This risk will be mitigated by engaging a High-Level Coalition of Leaders for Clean Cooking and the World Bank has a pipeline of USD 100 million of potential funding for clean cooking. Further, the methodologies for measuring impact-level results on gender, health, and climate (especially black carbon) are still nascent. However, the Clean Cooking fund will build on ESMAP's existing data-collection efforts (e.g., MTF and RISE) and will coordinate closely with World Bank gender, health, and climate teams on methods and measurement tools.

Annex 1: Preliminary Context Analysis

1. Context related to Clean cooking in Africa

Overall Development Challenges, Opportunities and Risks

Nearly 3 billion people still rely on solid fuels and traditional cookstoves to meet their daily cooking needs, with serious impacts on the health of millions of people and the climate (e.g., CO₂ emissions, deforestation, and short-lived climate pollutants [SLCPs]). The incomplete combustion of solid fuels results in HAP, including fine particulate matter (PM_{2.5}) and ozone precursors, which are responsible for 4.3 million premature deaths per year. Additional deaths occur as a result of exposure to ambient air pollution; HAP accounts for 12 percent of ambient air pollution globally, reaching up to 30 percent in South Asia and 37 percent in Sub-Saharan Africa. The health impacts are unevenly distributed, with women and children bearing the largest burden. HAP accounts for 27 percent higher risk of all-cause mortality in children (Bruce et al. 2013) and 73 percent higher risk of acute lower respiratory infections (ALRIs) in children, the leading cause of child death globally (WHO 2014).

Political economy and stakeholder analyses for clean cooking

Clean cooking continues to attract less attention and lower prioritization by development partners, owing to the fragmented and difficult nature of the sector, and the complexity of achieving interventions at scale. The total amount of finance for residential clean cooking dropped to US\$ 32 million in 2017. The 2015-2016 estimated annual average was US\$ 117 million, compared to the US\$ 4.4 billion annual investment estimated to be needed to achieve universal access to clean cooking by 2030 (SEforAll, 2019). Key barriers that explain this persistent lack of progress include:

- *A lack of awareness at all levels and adequate enabling environment*, from a limited political will demonstrated by many governments, to limited knowledge on the negative impacts of traditional cooking methods by the users, and resistance to change linked to various factors including risks of gender-based violence in certain contexts.
- *Technology-related challenges*, which include the limited availability of alternative fuels and cookstoves in a given context, and the difficulty to sustainably deploy alternative clean cooking solutions that can match both the available resources and the local cooking habits to facilitate adoption.
- *The cooking ecosystem for supply and demand generation is complex and fragmented*. There is a lack of interventions and solutions that respond to the needs of low-income and rural households, contextualized to local cooking practices and cultures.
- *Economic factors*, linked to the households' limited ability and willingness to pay for clean(er) cooking solutions. This particularly applies in rural areas where firewood usually does not have a direct financial cost for households, as opposed to charcoal in urban areas. The customers' affordability barrier translates to the difficulty for the private sector to develop viable and sustainable business models for the provision of clean cooking services.

The annual rate of increasing access to clean cooking fuels and technologies is low. While Asia made notable progress, has been particularly slow in Sub-Saharan Africa (SSA). Today about 900 million people, or around

85 percent of the population in SSA, lack access to clean, efficient, convenient, safe, reliable, and affordable cooking energy and rely on traditional and polluting fuels and technologies for cooking. In 22 low-income countries, mostly in Africa, it was less than 5% of population having access to clean cooking, This is costing the region US\$330 billion each year, driven by adverse impacts on women (US\$186.2 billion from lost productivity), health (US\$96.3 billion), and climate (US\$47.5 billion). Without evolving beyond the status quo, it is estimated that additional 475 million people will have no access to modern cooking solutions in SSA by 2030.

Fragility and conflict

The Clean Cooking Fund will encourage country/regional investment projects to include activities that address access issues faced by refugees and host communities. The Results-Based Financing (RBF) design should consider the challenges and costs involved in such engagements, and may provide higher RBF payments to encourage the private sector to deliver clean cooking solutions to refugees and host communities. The project teams will be able to access ESMAP's expertise and partnerships in this area. The innovation fund will also encourage innovative approaches to providing clean cooking solutions to refugees and host communities.

Providing adequate fuel for household and institutional use in displacement settings is a significant challenge for local authorities, humanitarian agencies, local communities and refugees. It is estimated that displaced families living in camps are burning 64,700 acres of forest (equivalent to 49,000 football pitches) each year. In many displacement settings, a crisis point is being reached in which firewood from the local environment is no longer available and no alternatives exist. It can also create conflicts with local host communities due to conflicting interest to natural resources.

People living in and around refugee camps and settlements often have little income, and the remote nature of these settings limits access to more modern energy products and services. At the same time, people in these settings are engaging in markets and using what little income they have to purchase traditional fuels for cooking. In the Kakuma refugee camp in Kenya, it is estimated that 17 per cent of refugees' median income is spent on cooking, amounting to \$4.99 per month, or more than is spent on lighting and phone-charging combined. A study by the Technical University of Denmark (DTU) found that 53 per cent of refugees in Nyarugusu, Tanzania, were spending nearly half their monthly capped income (\$12 out of \$27 legally allowed employment income) on cooking fuel.

Human Rights, Gender, Youth and applying a Human Rights Based Approach

Empirical evidence shows that women and children in developing countries can spend up to 10 hours a week gathering fuel, and this time poverty has detrimental impacts on access to education and income-generating opportunities. A global study by McKinsey and Company (2015) reports that 75 percent of the world's total unpaid work, including cooking and firewood and water collection, is done by women. Reducing the time and effort spent on this unpaid work could help in equalizing wage-labor participation rates, potentially shrinking income gaps between women and men. Women and girls shoulder most of the burden of care for the health impacts of HAP. They also disproportionately bear the risks of physiological injury from transporting large and heavy quantities of fuel; physical injury from fires, accidents, and explosions of cooking and heating appliances; gender-based violence (GBV) during fuelwood collection; and intimate partner violence (IPV) from delayed or poorly cooked food and disagreements over cooking and heating expenditures.

Women and girls are disproportionately affected by biomass fuel collection, cooking, and cleaning in terms of time poverty and drudgery, as well as negative health impacts due to exposure to household air pollution (HAP). Women who cook with traditional, polluting stoves and fuels have less time, energy, and opportunities to participate in economic activities and less power to make decisions. On the supply side, women can potentially participate actively in the clean-cooking supply chain since they are more likely to have first-hand knowledge of end users' cooking needs and better connections with local communities. For young girls, less time spent on firewood collections and cooking allows more time for studying.

Inclusive sustainable growth, climate change and environment

Residential burning of solid fuels contributes up to 58 percent of global BC emissions and 1 gigaton of carbon dioxide equivalent (CO₂e) emissions per year, making it an important climate issue. Because they are SLCPs, their removal can have a rapid impact on global temperature and thus represents an important short-term climate mitigation strategy. Clean cooking will have tremendous positive impacts on environmental degradation, air pollution and black carbon emissions. Though all approaches will have positive impacts, there is still discussion whether use of liquefied Gas (LPG) should be promoted as a clean cooking solution as it is not a renewable energy source.

The CCF is fully aligned with the WBG's climate change strategy and action plan and will directly contribute to its efforts in this area. Addressing climate change is one of the initiative's key drivers because of the strong linkages between access to clean cooking and the negative environmental and climate impacts from cooking with traditional stoves and fuels (e.g., CO₂ emissions, deforestation, and short-lived climate pollutants [SLCPs]). In this context, the CCF will ensure that the activities financed align with, strengthen, and contribute to countries' nationally determined contributions (NDCs). Technical assistance activities will be encouraged to integrate adaptation and resilience considerations into the design and development of country investment projects. Reductions in tCO₂e linked to SLCPs like black carbon (BC) emissions are part of the RBF payment results indicators. Monitoring the progress of climate change impacts will be conducted at both the project and program levels. The Results Framework includes indicators for climate change impacts (Annex 3).

The WB has cultivated deep experience and technical knowledge on creating carbon/climate markets and developing results-based climate finance (RBCF) approaches. Housed in the WB's Climate Change Group (CCG), these funds and initiatives have measured a combined \$3.8b+ in capital over almost 20 initiatives, yielding 210m+ tCO₂e purchased to date from 200+ projects in 56 countries – with 45m+ tCO₂e yet to be delivered. Many of these efforts already support the cooking sector and will continue to do so in the context of the Paris Agreement. These include the Carbon Initiative for Development (Ci-Dev) trust fund, which has signed purchase agreements for almost \$40 million in GHG emission reductions from seven clean cooking projects in Africa and Asia, and with plans to do more. It also includes landscape-based approaches supported by the BioCarbon Fund's Initiative for Sustainable Forest Landscapes (ISFL), and work on operationalizing Article 6 of the Paris Agreement (among others). The CCF's support for quantifying and making payments against verified impact-level climate results related to SLCPs will complement these initiatives, which already and will continue to support payments against impact-level climate outcomes quantified in all other GHGs (as well as their tCO₂e).

2. Water

Overall Development Challenges, Opportunities and Risks

Tanzania's stable political and macroeconomic environment has supported inclusive growth. With steady, pro-poor growth averaging 6.5 percent per annum, Tanzania has been one of the stronger performers in Sub-Saharan Africa (SSA) over the last decade. Based on the national poverty line, headcount poverty fell from 34 to 28 percent between 2007 and 2012, and extreme poverty fell by 2 percentage points over the same period but remains high in absolute terms.

Rapid population growth, high urbanization rates, deep poverty in rural areas and inequality remain persistent challenges. Tanzania's population of nearly 54 million is growing rapidly at about 3 percent per year and is expected to reach 100 million by 2040. About a third of the population lives in urban areas and at current rates it is estimated that half of the population will be living in urban areas by 2050, driven primarily by population growth and rural-to-urban labor migration. Urbanization is having, and will continue to have, an impact on urban development and heightens the need to ensure sustainable living conditions, including service provision, housing, sanitation, and waste disposal. While the last decade saw a reduction in overall inequality and an increase in the growth rate of consumption of the bottom 40 percent, large income and welfare differences exist between urban and rural citizens, and men and women. Over 80 percent of poor and extremely poor Tanzanians live in rural areas and depend on natural resources-based livelihoods and subsistence farming.

Tanzania's rich natural resources underpin the economy and rural livelihoods. Natural resources, both renewable and non-renewable, account for more than 57 percent of all goods exports, and appropriate management of the natural resource base—particularly its water, land, forests, and wildlife—is vital to Tanzania's economy. Water and wood fuels together provide an estimated 90 percent of Tanzania's energy needs. Tanzania is now officially water stressed, with likely corollary effects on energy production, agriculture, and the livelihoods of the poorest. The country's unique wildlife assets fuel a vital tourism industry that is an important contributor to GDP (13 percent of GDP in 2016). Tourism also provides a stable source of revenue and foreign exchange for the Government. Agriculture continues to support most Tanzanians, providing 67 percent of employment and 98 percent of rural women's livelihoods.

Government's policy and strategy focus on industrialization and human development must be underpinned by a more intense focus on water security. The Fifth Phase Government has outlined an ambitious vision for the country, which focuses on human development and envisages Tanzania becoming a semi-industrialized nation by 2025. According to this Vision, agro-industry is the basis of industrialization, and agricultural expansion is the foundation for food security. Both goals are also dependent on urban service provision, including water supply and sanitation, which underpin human capital outcomes such as reduced child mortality and stunting, and retaining girls in schools.

Urban centers – including Dodoma, Arusha and Tanga - are critical to government plans. Several recent decisions have changed the landscape of Tanzania's urban areas. Over the past two years, much of the executive branch of government has relocated to Dodoma, significantly increasing the population of the city of Dodoma and necessitating a fast-tracked urban development plan. The government also announced plans to improve the port in Tanga and to build a dry-port in Arusha city. These two cities are already major industrial centers and transportation and industrialization related investments are slated to rapidly increase available urban-jobs and the size of these two major cities.

Political Economy and Stakeholder Analysis

Tanzania's economic growth, and therefore prospects for rapid poverty reduction, is significantly dependent on water resources. Water is a critical input for the economy, environment, and society, where

every major sector (energy, tourism, agriculture, mining, and industry), and the resource and agriculture based-livelihoods of the poor, depend on availability of sufficient water resources. The latest official data (from 2002) suggests that 89 percent of Tanzania's water withdrawals are for agriculture, 10 percent for domestic consumption, and only about 1 percent for industry. Manufacturing in Tanzania is dominated by agro-processing, which is highly dependent on water, as is mining, tourism, and energy generation. About 40 percent of Tanzania's energy comes from hydropower, which is operating below its potential because of upstream water withdrawals.

Fragility, Conflict and Resilience

The COVID-19 pandemic has had significant negative impacts on Tanzania's growing economy with substantial economic costs. Real economic growth for the 2020 is projected to slow down to 2.5 percent with substantial downside risk (TEU 2020), a sharp decline from pre-COVID estimations of 6 percent. The pre-COVID poverty rate, though decreasing slowly in the last decade, remains high with 26.4 percent of Tanzanians or 14 million people considered poor. An additional 500,000 Tanzanians who previously clustered around the poverty line could now fall below due to COVID-19, particularly those in urban settings relying on self-employment and informal/micro enterprises. About one third of workers in tourism & hospitality are working informally and the proportion is higher for women (50 percent). As a result, urban poverty is likely to increase with a disproportionate negative impact expected on women, youth, and households with elderly persons. While COVID-19 impact in rural areas is relatively milder, more than 1 million Tanzanians could fall below into poverty if the economy grows below 2.5 percent and the global pandemic is protracted (TEU 2020).

Tanzania also remains vulnerable to climate and disaster risks. The country is experiencing challenges related to climate change, including unpredictable rainfall, rising temperatures and sea levels, and an increase in extreme weather events. Extreme events are expected to worsen in the coming years and could threaten livelihoods, infrastructure and public health, among other adverse effects. Tanzania has a National Climate Change Strategy (NCCS) guiding the prioritization of key investments to improve resilience to climate change in high risk areas.

Tanzania has become water stressed. Over the last 25 years Tanzania's renewable freshwater resources per person have dropped from over 3,000 m³/capita/year to around 1,600 – beneath the commonly accepted water stress threshold of 1,700 m³/capita annually. Over the same period the size of the economy has tripled, and formal and informal irrigation has expanded, all of which rely on increasing use of already over-stressed water resources. Water demand has exceeded dry season supply by up to 150 percent in some areas, a gap that can only be filled by taking a systems approach to improving water management. Unreliability of water supply impacts public health, limits investment and economic growth, and repeated shortages create perceptions of government failure, deepen social inequalities and intensify tensions.

Water stress is also impacting social and environmental resilience. In rural areas, household water is withdrawn from the same rivers and aquifers that farmers rely on for irrigation. Water scarcity diminishes social and environmental resilience when basic user needs are not met, impacting health, employment, and livelihoods. Lack of bulk-water availability exacerbates time burdens (e.g., women walk long distances to collect water permitting less time for economic productivity) and women's small holder farms are less prioritized for distribution during drought. Decreasing water quality from insufficient waste water treatment, increasing salinity due to improper irrigation, scarcity and unregulated industrial discharge all have negative

impacts on human health and ecosystem function in most basins and in estuary systems where major rivers such as the Pangani meet the ocean. A massive economic toll is taken through disrupted long-term human capital (by lost education opportunities, nutrition and growth, and loss of work opportunities from sickness), which further increases female caretakers' time burden in caring for sick family members. Several globally significant ecosystems are being impacted by water stress, including the Ruaha National Park.

Flood and drought have a major social and economic impact on Tanzania and prevalence and length/intensity of these water-related shocks are increasing as the climate changes. For example, the agricultural sector suffers an estimated US\$200 million in annual losses because of weather-related shocks, largely from drought. Hydropower production, around 40 percent of energy generation in Tanzania, also drops during droughts, creating major additional energy generation costs for the country. Water borne pollutants are also intensified by the rise in temperature. With climate change, Tanzania will have to deal with increasing challenges of scarcity, variability, and quality.

Tanzania can become more resilient to climate change and other stressors by taking a systems approach: tackling urban and rural water systems, together. Despite these challenges, water does not have to become a significant constraint to growth. Tanzania still has comparatively generous water resources compared to many other African economies. The challenge is how to manage water better, to allocate water to uses that maximize the economic, social, and environmental benefits for the country and in doing so, build resilience to recurring drought and long-term effects of climate change for all members of society. To improve water security for growth and secure water sources for urban centers, Tanzania must:

1. advance urban infrastructure to store water and maintain water quality
2. advancing rural watershed and agricultural water management to protect water sources
3. strengthening institutional systems and building skills to ensure sustainable implementation of both of those connected systems.

Innovative approaches are needed to secure water for urban centers and combat impacts of drought. Innovation is the key to addressing the long-term challenge of climate adaptation and building more resilient communities. Elements of resilience that are needed for both human and built systems include preparedness, diversity and redundancy, integration and connectedness, and robustness. Innovation can help clients integrate resilience into their water management systems – for example, developing diversified water sources in areas experiencing water stress or providing information platforms to connect communities with each other and the regulatory authorities can provide elements of diversity and connectedness. Coupling green infrastructure with built infrastructure often provides a strong platform for integrating resilience into water systems. Tanzania needs to couple traditional water storage infrastructure with innovative and drought resilient water management infrastructure to improve its drought resilience through activities such as improving groundwater access, employing managed aquifer recharge infrastructure, building sand dams, and using groundwater management tools are some example of green-grey infrastructure combinations that water managers in semi-arid locations around the world employ to combat drought and overcome the challenges of increasing aridity. For example, Dodoma, the new administrative capital of Tanzania, is in a semi-arid area, far from any perennial surface water body. Seasonal water bodies do not even flow each year and water levels are highly unpredictable because of highly variable inter-annual precipitation patterns and are commonly and heavily impacted by drought. Improving groundwater management and employing

managed aquifer recharge will help Dodoma become more resilient to climate change and drought impacts, and better serve the needs of its people.

Annex 2: Preliminary Partner Assessment

1. Clean cooking

A paradigm shift is needed to raise high-level political commitments and scale up public- and private-sector investments in the cooking sector. There is a need to bring civil society, private sector, financing institution, multilateral development banks, public institutions and international donor agencies together to revitalize high-level political commitment for clean cooking.

The dedicated CCF will co-finance and leverage concessional finance from the WBG and other MDBs, primarily utilizing Results-Based Financing (RBF) approaches to incentivize the private sector to invest, innovate, and deliver impacts in the sector. The fund will also support and complement a High-Level Coalition of Leaders for Clean Cooking, Energy, and Health which is being convened by the World Health Organization (WHO), the United Nations Development Programme (UNDP), the United Nations Department of Economic and Social Affairs (UNDESA), and the World Bank under the Health and Energy Platform of Action (HEPA) to create the necessary political momentum for clean cooking solutions. Other stakeholders include the Clean Cooking Alliance (CCA), Energising Development (EnDev), the WHO, SEforALL, and the Climate and Clean Air Coalition (CCAC).

Mobilizing national and international stakeholder engagement would particularly be done through pillar 2 of the CCF. The pillar will work with development partners to mobilize high-level political commitment at both the global and country levels and increase knowledge, innovation, and policy coordination. Multi-stakeholder partnerships and platforms are necessary to “change the game” on clean cooking. This pillar will build on various initiatives and partnerships and align efforts to mobilize high-level political commitments for the sector; generate and disseminate knowledge; and promote continued innovation in technologies, businesses, and policies. In country specific project, close dialogue will be made with public authorities, private sector and civil society actors.

Water

The key stakeholders include:

- RUWASA, lead agency (Representation at the National, Regional and District levels)
- The Ministry of Water
- PPP Desk under the Ministry of Planning and Finance
- Water and gender specific Tanzanian NGOs
- The World Bank
- IFC
- Private sector:
 - Solar water pump suppliers and distributors
 - Pre-paid meters suppliers and distributors
 - Female hygienic pads suppliers and distributors
 - Investors
- Community Based Water Supply Organizations
- Local politicians and representatives

- Water customs

The Rural Water Supply and Sanitation Agency (RUWASA) is a newly established agency responsible for the development and sustainable management of water supply and sanitation projects and water service delivery in rural areas. The agency is working under the Ministry of Water and it was inaugurated on July, 2019. RUWASA has regional and district level offices and works closely with local government agencies and communities especially including the village-level Community-Based Water Supply Organizations (CBWSOs). RUWASA Core Service Delivery Mandate includes the following:

- Development and sustainable management of rural water supply and sanitation projects
- Register and regulate the performance of community based water organizations
- At community level, water services provision is managed by legally established organizations known Community Based Water Service Organization (CBWSOs). These organizations are formed, registered and regulated by RUWASA.
- **Legal mandate to execute PPP projects:**
 - Promotion of public sector and private sector partnership in provision of water supply and sanitation services Advise the Minister on issues related to rural water supply and sanitation (Act No. 5 of 2019, page 13)
- **Legal mandate to charge and collect revenue:**
 - The Authority shall be to collect fees and levies including any regulatory levy for water supply and sanitation services supplied to consumers by the water authority; (Act No. 5 of 2019, page 24)
 - Install water meters for the purpose of measuring the amount of water supplied to a consumer; (Act No. 5 of 2019, page 25)
 - Charge fees for services rendered; (Act No. 5 of 2019, page 25)

There is a range of domestic and international NGOs or civil society groups in the water sector, some playing an important part of the sector development. The private sector is also well represented in rural water supply in Tanzania, but private companies have traditionally not been involved in long-term service contracts or any kind of financing schemes.

Annex 3: Preliminary Result Framework

Water

Results Area	Description	Baseline	Target	Completion
Outcome indicator 1	Rural residents with basic access ¹⁰ to sustainable water services through improved solar water pumping systems. (People)	0	700,000 ¹¹	2024
Outcome Indicator 2	Private financing leveraged (USD) 60%	0	7,488,000 ¹²	2024
Output Indicator 1	Villages assessed	0	218	2024
Output Indicator 2	Water schemes ¹³ rehabilitated and upgraded with solar and pre-paid technology	0	218	2024
Output Indicator 3	Villages with the water tariff linked to supply of reusable antimicrobial treated female sanitary pads.	0	50	2024

Clean Cooking: Results framework linked to Theory of Change

Theory of Change GOAL: Accelerated progress on access to clean cooking		
OUTCOME: Improved access to clean cooking in client countries		Target FY24
Outcome Indicator 1	Number of people gained access to clean cooking resulting from policies, programs and strategies informed by ESMAP	200 million
Outcome indicator 2	Number of people gained access to clean cooking resulting from financed projects catalyzed by ESMAP	100 million
Outcome indicator 3	Amount of investments mobilized (including both public and private financing)	USD 2 Billion
INTERMEDIATE OUTCOME: Governments adopt policies and regulations to support public and private sector investment in clean cooking		Target FY24
Intermediate outcome indicator 1	Number of policies and regulations adopted by the governments to support clean cooking market development	30
Intermediate outcome indicator 2	Number of WBG/MDBs investment projects catalyzed by the CCF	30
Intermediate outcome indicator 3	Percentage of CCF-supported projects that have proactive actions to promote female employment/entrepreneurship and gender co-benefits	100%
OUTPUTS:		Target FY24
Output 1.	Strategies, policies, regulations to support clean cooking	40
Output 2.	Joint activities by partners for global outreach or country-level program coordination	30
Output 3.	Innovative technology, business, and financing approaches, incorporating both women's and men's preferences and needs	20
Output 4.	Own-managed knowledge products (including RBF data platform) on clean cooking with one global flagship report every other year.	10

¹⁰ <https://washdata.org/monitoring/drinking-water>

¹¹ Based on an average village population of 3,200.

¹² Cost per scheme (US\$60,000) * 218 schemes (villages) * 60% private financing

¹³ A water supply system is a system for the collection, transmission, treatment, storage and distribution of water from source to consumers

Annex 4: Preliminary Budget Details

Indicative overall budget	DKK (million)	USD
Engagement 1: Access to water in Tanzania		
Outcome 1.1: Investment in water infrastructure	35.00	5.75
Outcome 1.2: Feasibility Study, Extensive Community Consultation and Gender	6.00	1.00
Engagement 2: Access to clean cooking		
Output 2.1: Clean cooking country investments in Africa	36.45	5.99
Output 2.2: Global knowledge and innovation	4.05	0.67
Programme management		
Management fee (5%)	4.5	0.74
Contingencies (5%)	4.0	0.66
TOTAL	90.00	14,80

Annex 5: Preliminary Risk Management Matrix

Clean cooking Fund: Primary Risks and Mitigation Measures for Project Design and Monitoring

Risk	Risk mitigation and management
<p>PRIORITIZATION: Competing priorities or interests at the country or sector level may constrain the ability to meet the Clean Cooking Fund's objectives for transformative interventions. Country demand for MDB co-financing is lacking.</p>	<p>The Clean Cooking Fund will support the establishment of the High-Level Coalition of Leaders for Clean Cooking, Energy and Health, which will seek to prioritize clean cooking within the countries. The World Bank already has a pipeline ready with US\$100 million in IDA co-financing, and more projects are under discussion with countries. The World Bank is developing an energy access initiative for Africa, which will include a target for clean cooking.</p>
<p>COORDINATION: A large number of country projects and stakeholders impede effective coordination and collaboration.</p>	<p>Through the Efficient Clean Cooking and Heating program, ESMAP has already built strong partnerships with internal and external stakeholders in the sector. The Clean Cooking Fund will strengthen and expand those partnerships with resources allocated for coordination at both country and global levels. ESMAP is an active partner in a number of global platforms and initiatives.</p>
<p>METHODOLOGY & MEASUREMENT: The methodologies for measuring impact-level results on gender, health, and climate (especially black carbon) are still nascent, suggesting that measurement costs and uncertainty could be high.</p>	<p>The Clean Cooking Fund will build on existing data-collection efforts (e.g., MTF and RISE) and will coordinate closely with World Bank gender, health, and climate teams on methods and measurement tools. Currently, ESMAP is conducting a field study to test methods for measuring impact-level results on gender, health, and climate. The Clean Cooking Fund will also invest in data-collection and verification innovations.</p>
<p>CONTEXT: The political economy of fragility, conflict, and violence (FCV) countries is blocking progress on access to clean cooking.</p>	<p>Specific approaches suitable to various FCV contexts will be adopted, including greater reliance on and collaboration with the local private sector, nonprofit partners, and UN agencies. The RBF Facility will provide additional incentives for delivering clean cooking solutions in FCV areas.</p>
<p>PERFORMANCE: Results may be affected by unpredictable field conditions beyond the private developers' control, with the actual performance lower than expected. This may be particularly affected by the COVID-19 pandemic.</p>	<p>Design of the Clean Cooking Fund's RBF mechanism, whereby donors pay only on demonstrated/verified performance, inherently mitigates donors' exposure to performance risk. Country/regional investment project will be designed with flexibility (esp. RBF payment schemes) to allow adjustments based on market conditions.</p>

CAPACITY: The implementing countries' limited capacity, especially in terms of institutional and human resources, impedes the likelihood of project success.	The Clean Cooking Fund includes resources for capacity strengthening and builds in technical-assistance and policy-support components.
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Water

Contextual risks

Risk Factor	Likelihood	Impact	Risk response	Residual risk	Background to assessment
Change of political support for PPP transactions	Likely	Major	Program approach to be changed from PPP to simpler and more acceptable approach, similar to the previously accepted pilot approach. Situation to be monitored closely	Residual risk reduced.	The Tanzanian Government has long been skeptical of PPPs. This has changed in recent years but the political environment can be volatile.
The macro economic risk to the project.	Very unlikely	Insignificant	The PPP risk structure can be amended to reduce the private sector's exposure to this risk	Residual risk reduced.	The Tanzania economy has been relatively stable for more than a decade and an economic shock may likely increase the need for PPP transactions for basic service deliveries.
Community skepticism to increase private sector involvement	Very unlikely	Significant	Increased dialogue with relevant local authorities and key stakeholders on preventive measures.	Residual risk reduced. This approach was deemed effective during a recent pilot project of 110 villages.	Through extensive local stakeholder consultation with more than 200 villages and local authorities, it is clear that a majority of rural villages open to private sector involvement.
Damage to groundwater sources	Very unlikely	Significant	Borehole yields (production volume) are to be examined carefully including test pumping and each borehole will be equipped	Residual risk reduced.	This issue has mainly been an issue in Asia (India and Pakistan) and normally associated with overpumping linked to irrigation. Since this project will focus on water supply (drinking water) in Tanzania, the risk is very low.

			with a remote water level sensor to enable live monitoring of groundwater levels		
Conflict over water sources	Likely	Minor	The program will significantly increase dry season water availability which should reduce risk of conflicts. More importantly, the risk of conflict is carefully assessed prior to construction and often well-known by the local authorities.	Residual risk reduced.	Conflicts among different pastoral communities are common in East Africa. However, the Tanzanian police is increasingly being used to mediate and protect communities in conflict hotspot areas. Generally, this type of conflicts are more common in Kenya and not as prevalent in rural Tanzania.

Programmatic risks

Risk Factor	Likelihood	Impact	Risk response	Residual risk	Background to assessment
Underperformance by private sector	Likely	Major	A performance bond and other sanctions in the PPP concession agreement will incentivise the private sector to deliver the agreed services. A termination clause can also be used to close underperforming PPP concession agreements	Residual risk reduced.	The Tanzania business environment does not always lead to successful partnerships between the Government and the private sector.

Annex 6: List of supplementary materials

Annex 7: Plan for communication of results

1. General audience: World Bank blogs (2)
2. General Danish audience: Danish newspaper: Up-ed
3. Technical audience: The annual Stockholm World Water Week. <https://www.worldwaterweek.org/>
4. General and technical: World Bank BBL Presentation Format (1)
5. Video: 3-minutes.

Annex 8: Project Action Plan

Action/product	Deadlines	Responsible/involved Person and unit	Comment/status
Project identification for Finance Bill 2021	April 2020		In finance bill
Dialogue with partners	October - December		
Prepare concept note	January-February 2021		
Confirm agenda item for Programme Committee	4 February		
Submit concept note to Danida Programme Committee including public consultation	2 March		
Danida Programme Committee	25 March		
Prepare programme documents including annexes	Mid-April		
Appraisal	End April		
Incorporate recommendations from appraisal into programme documentation	Early May		
Confirm agenda item on Council for dev. Policy	15 April		
Submit programme documentation including annexes to Council for Development Policy	6 May		
Council for Development Policy meeting	27 May		
Approval of the programme by the minister	Early June		
Prepare "aktstykke"	Early June		
Meeting in the Finance Committee	June		
Signing of agreement	July		
First disbursement	July		

Annex 9: Appraisal recommendation

Annex 10: Theory of change

Theory of Change for the Clean Cooking Fund

