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

Key results:

- Number of people provided with access to clean cooking (target: 500,000)
- 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 7,416,000)
- Strengthened co-benefits related to a green energy transition in Africa within low-carbon water management, green job creation and improved health benefits and climate resilience
- Gender targeted investments contributing to enhanced gender equality.

Justification for support:

- Accelerate speed and scale to achieve progress towards SDG6 and SDG7 through catalytic financing mechanisms.
- Alignment with the Strategy for Development Cooperation and the Danish Government's Strategy for Global Climate Action as well as development policy signature priorities and build back better and greener approach.
- 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 human right, and will enhance the quality of life by and contribute to improvements in human health, child education and economic productivity.

Major risks and challenges:

- Results may be affected by unpredictable field conditions and Covid-19 beyond the private developers' control
- Conflict over water sources and change of political support for PPP transactions
- Competing priorities at the country level may constrain the ability to mobilize high-level political commitment and public financing for clean cooking.

File No.	2021-10293				
Country	Regional				
Responsible Unit	GDK				
Sector	Energy and Water				
Partner	ESMAP				
DKK million	**2021**	**2022**	**2023**	**2024**	**Total**
Commitment	95				95
Projected	23.30	27.75	27.75	16.20	95
Duration	2021-2025 (4 years)				
Previous grants	Support to ESMAP (2020-17816)				
Finance Act code	06.34.01.40				
Head of unit	Karin Poulsen				
Desk officer	Morten Blomqvist/Tobias von Platen				
Reviewed by CFO	Christina Hedegård Hyttel				

Relevant SDGs

Strategic Objective:

The strategic objective is to provide catalytic financing that delivers 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 to targeted projects that accelerates improved access to energy and water as well as clean cooking technologies and fuels in Africa.

Summary:

The contribution to access clean energy, water and green jobs in Africa is aligned with the priorities of Denmark's Strategy for Development Cooperation 2021-2025, will contribute to the SDGs, 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.

Budget (DKK million):

Engagement 1 – Access to Water	41.00
Engagement 2 – Access to Clean Cooking	41.00
Engagement 3 – Job creation and energy transition	4.55
Programme Management	8.45
Total	**95.00**

Programme Document

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

Version for UPR

September 13, 2021

F2: 2021-10293

List of Acronyms and Abbreviations

BC	Black Carbon
CBWSO	Community-Based Water Supply Organizations (Tanzania)
CCF	Clean Cooking Fund
DKK	Danish Kroner
ESMAP	World Bank's Energy Sector Management Assistance Programme
GDK	Department for Green Diplomacy and Climate, Danish MFA
GDP	Gross Domestic Product
GHG	Greenhouse gas
GoT	Government of Tanzania
GPRBA	Global Partnership For Results-Based Approaches
GWP	Global Water Partnership
GWSP	Global Water Security and Sanitation Partnership
JMP	Joint Monitoring Programme on SDG6 (WHO & UNICEF)
MFA	Ministry of Foreign Affairs of Denmark
MHH	Menstrual Health and Hygiene
NDF	Nordic Development Fund
PPP	Public Private Partnerships
RUWASA	The Rural Water Supply and Sanitation Agency (Tanzania)
SDG	Sustainable Development Goals
ToC	Theory of Change
UN	United Nations
UNICEF	United Nations Children's Fund
US$	United States Dollars
USAID	United States Agency for International Development
WASH	Water, Sanitation and Hygiene
WB	The World Bank
WHO	The World Health Organization
WSSCC	Water Supply Sanitation Collaborative Council
WSDP	Water Sector Development Programme (World Bank)

Table of content

1. Introduction

This progamme document presents a targeted Danish support aiming at stimulating green and climate resilient access to energy and water in Africa through the World Bank's multi-donor trust fund ESMAP (Energy Sector Management Assistance Programme). The Danish support is targeted specific activities and complements the Danish core support to ESMAP's Business Plan 2021-2024. The total Danish contribution will amount 95 million DKK and will be divided into three targeted engagements to be channeled through the ESMAP umbrella 2.0 trust fund, including co-financing to specific World Bank projects as recipient-executed activities:

(i) *Rural solar-powered water supply in Tanzania.* The project objective is contribute to the overall improvement of quality of life, gender equality, climate resilience and health of vulnerable communities through increased and more sustainable access to rural water supply for households, health clinics and schools.

(ii) *The Clean Cooking Fund (CCF) in Africa*. The objective of the fund is to mobilize political commitment and scale up financing to access to clean cooking, promote more private-sector financing and technological solutions to deliver clean energy service to cooking. The CCF will complement IDA funded World Bank energy projects and will be recipient executed approved together with the IDA-funded project.

(iii) *Mapping potential green energy-related jobs in Africa.* The objective is to explore and map where and how green jobs can be created in Africa, and identify how local job creation can integrated in the future energy project, policy and investments designs. This activity will be implemented directly by the ESMAP team as part of the analytical work and technical assistance. It will be Bank executed activity.

The Danish support to the interventions builds on decades of experiences of providing clean water and clean cooking to underserved communities in Africa. Based on lessons learned and existing community structures, the projects aim to apply new technologies and business models to reach the poor and vulnerable populations while leveraging private investments.

Denmark' new Strategy for Development Cooperation (June 2021) emphasises the urgent need to enhance climate resilience in developing countries while simultaneously transitioning to green energy solutions aligned with the Paris Agreement. Furthermore, a priority is to support developing countries to Build Back Better and Greener in the midst of COVID-19 pandemic. The urgent need for accelerating climate action has also been underscored by the sixth assessment report by the Intergovernmental Panel on Climate Change (IPCC) that was launched in August 2021.

The support to the three interventions under the umbrella of ESMAP is designed to deliver targeted action aligned to the new Strategy for Development Cooperation and to the Danish Government's long-term Strategy for Global Climate Action. The interventions will specifically support the Danish efforts to close the gap for access to clean energy and water in Africa through innovative approaches, which is a key Danish priority. The specific focus on access to clean cooking and water will contribute to improve health, human rights and job creation. Further, it will strengthen gender equality by reducing both women's domestic

workload and exposure to health risks and gender-based violence by reducing time and risk exposure when collecting water and fire wood.

The overall purpose of the Danish contribution is particularly to provide catalytic development finance to scale innovative technological and financial models targeted clean cooking and access to clean water. Stimulated by rapid declining prices on renewable energy, the project activities support new business models based on blended financing that can reach up to 500.000 people with clean cooking solutions and 700.000 people with improved water access. Furthermore, the support will also explore how green energy projects and investment can enhance the green job potential in Africa.

The project document has been designed with an overall introduction to the Danish support through the ESMAP umbrella where after the three areas of support is presented separately following the Aid Management Guidelines.

2. The development challenge, rationale and institutional set-up

2.1. Opportunities and challenges for a green energy transition in Africa

A green energy transition is a prerequisite for many SDG's and can be a catalyst for improving the living and working conditions for the poorest and most vulnerable populations as well as secure basic human rights. Access to renewable energy provides new opportunities to accelerate inclusive and sustainable, models aligned with the Paris Agreement and the SDG's. New off-grid energy solutions is providing new opportunities and the lower prices on solar energy and battery solution has made renewable energy cost-competitive with fossil fuel.

Receiving access to clean energy and water can help people lift themselves out of poverty and enhances their prosperity, health, safety, well-being, educational, and entrepreneurial opportunities; it also advances gender equality and social, economic, and political equality goals. Renewable energy helps diminish environmental degradation and is critical to abating climatic pressures and has the potential to be a key contributor to achieve net-zero emissions in a just and inclusive way by 2050.

More than 900 million people, or around 85% of the population in Sub-Saharan Africa, lack access to ***clean cooking***. 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. Furthermore, in Sub-Saharan Africa the absolute number of people relying on polluting cooking fuels and stoves continues to rise.

Despite limited progress on achieving clean cooking in Africa, new technologies, fuels and business models together with renewed political commitments opens new hope for progress. New targeted efforts that will be supported by the Clean Cooking Fund (CCF) will be designed to meet local consumer behavior and cooking needs through results-based financing that is bridging the affordability gap that exist today and allowing the private sector to scale-up their solutions based on local demands.

In Sub-Saharan Africa only 54% of the population have access to ***safe drinking water*** **–**and eight out of 10 people without basic water services lived in rural areas. (UNICEF/WHO Joint Monitoring Programme 2020). Despite important progress has been made on meeting the target on SDG 6.1 (drinking water) Sub-Saharan Africa is experiencing the slowest rate of progress in the world. There are two fundamental reasons for this

high number of underserved people in Africa. First, frequent breakdowns of rural water systems, and second, high capital and operational costs. Evidence suggests that a majority of rural water pumping systems powered by a diesel generator are not financially sustainable. Evidence also suggests that about one-in-five newly constructed water schemes break down within the first few years often due to financial constraints.

However, prices for the solar panels used for water pumping systems have dropped by approx. 80% over the last 8 years. In addition, these panels last around 25 years, require limited maintenance and do not depend on expensive and unreliable diesel supplies. Stand-alone solar power provides new opportunities to improve access to water, lower the operating costs and leap-frog green technology with a lower carbon footprint. As such, opportunities for applying a build back better and greener approach are feasible through rehabilitation of existing water schemes, increased service reliability through private sector involvement, increased revenue collection and reduced operating expenses.

The energy transition away from fossil fuel is often overshadowed by the potential loss of jobs and economic growth. More specific knowledge to where new ***green jobs*** will be created, what type of jobs, for whom and how many is currently absent in for most African countries. Today calculation of future creation of green jobs is based on data and experience from developed countries. Not how it would play out in Africa where new access to off-grid energy would produce both direct, indirect and induced jobs.

A more thorough understanding of potential job-creation from a green energy creation needs to up-stream inputs (e.g. increased demands for minerals), broad understanding of direct jobs creation in the green energy sector and induced jobs created as a larger share of the population and small business can access off-grid energy services in Africa. Applied research based on cases and more thorough elaborated methodologies can inform new energy policies, projects and investment to maximize local and inclusive job creation.

2.2. Institutional set-up and lessons learned

Denmark has been a long-term partner to ESMAP for more than 20 year. Denmark has over the years provided both core funding to ESMAP but has also provided preferenced funding to specific areas of ESMAP's work or associated trust funds[1]. This includes preferenced funding to the Mini-grid facility and the Energy Subsidy Reform Facility but also the associated trust fund such as the SIDS DOCK targeted small island developing states. The current Danish contribution to ESMAP's Business Plan 2021-2024 is also divided between core funding and 'preferenced' funding to specific areas of the Business Plan, including off-shore wind, access to energy and clean cooking. ESMAP has delivered solid results over years, played a significant role in greening the World Bank's energy portfolio and and honoured preferenced funding to specific areas of ESMAP's business plan.

ESMAP is a donor-funded global knowledge and technical assistance program, administered by the World Bank. It is hosted in the Energy and Extractives Global Practice (GP) and consists of about 45 staff in Washington DC. ESMAP follows a four-year Business Plan, which is endorsed by its donors. The new Plan covering fiscal 2021-2024 has two overarching objectives to achieve: (i) universal access by 2030 (SDG 7); and (ii) decarbonization across the energy sector in support of international commitments on climate change.

[1] ESMAP operates with the term 'preferencing' which means that a donor country can make a preference to a specific activity within ESMAP or to an associated project/trust fund. This opportunity is commonly applied by ESMAP donors and respected by ESMAP. This opportunity has been established to avoid formal earmarking which requires setting up separate trust fund within the World Bank, which is administrative burdemsome for both the donor and the World Bank.

This is accomplished through (i) grants to the World Bank's regional units that fund analytical, advisory and project development activities linked to the World Bank's country dialogue and lending programs, (ii) grants for recipient-executed activities that co-finance IBRD/IDA lending; and, (iii) ESMAP's own-managed global activities, generally focusing on generating and disseminating knowledge. All reciepient executed activities will follow IDA/IBRD processes and procedures for approval, incl. compliance to safeguards and Board approval.

ESMAP is governed by a Consultative Group (CG) comprised of representatives from contributing donors and chaired by the World Bank and with a vice-chair represented by the Donors. The CG meets annually to review ESMAP's strategic direction, achievements, use of resources and funding requirements. In addition, ESMAP also convenes a Technical Advisory Group (TAG) of leading thinkers in the energy sector so that cutting edge technical and strategic insights to inform the ESMAP management, the CG and strategic inputs to ESMAP's work program. The TAG does not have decision-making authority over budgets or allocation of funds, rather it provides inputs and advice. It is plan that the TAG will meet for the planned mid-term review in April 2022, at beginning of the planning of the next Business Plan in November 2023 and additional ad-hoc meetings can be organized, e.g. to seek feedback and guidance on urgent challenges such as the Covid-19 response.

In January 2020 the World Bank adopted its Umbrella 2.0 Trust Fund Reform as a flexible and more efficient way to manage core and targeted grants by donors to trust funds. It will result in fewer, larger and more strategically aligned trust fund programs. It will also lead to improved reporting while also allowing donors to preference their funding easier. The new umbrella 2.0 trust fund structure will be able to receive core funding, preferenced funding or earmarked by association[2]. By this, the fund management becomes more strategic and efficient while still responding to the increasing demand from donors to target their grant contributions to specific areas of the World Bank's work.

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 provides donors with the option to make "preferenced" or "earmarked" supplemental contributions to both Bank and recipient-executed trust funds. 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. In practice, it means that it will be easier to co-finance IDA-projects with options to channel funds directly to the umbrella trust fund and/or through associated trust fund under the ESMAP umbrella. This structure will also allow ESMAP to mobilize co-financing for priority areas from the Green Climate Fund and Climate Investment Funds. As a member of the Consultative Council, Denmark has supported the development of ESMAP's umbrella approach and structure and the possibilities of targeting more resources to specific thematic areas and projects in a less administrative burdensome way.

In this way, the ESMAP umbrella structure is an efficient entrance point to provide financing for targeted projects that accelerate access to energy and water in Africa. Due to the long trusted partnership with ESMAP and to ensure a lean programme approach, Denmark will make its contribution preferenced to the three activities with a regional focus on Africa.

[2]An "earmarked" contribution can be made by channeling a contribution to an associated trust fund that will finance activities for specific purposes or in specific countries (or both), within the overall scope of the Umbrella 2.0 program. (For details, see TFReformTransitionGuide.pdf (worldbank.org).

One part will be preferenced as support to the Clean Cooking Fund, an associated multi-donor trust fund that is fully integrated in ESMAP's 2021-2024 Business Plan and results framework. The Clean Cooking Fund is a recipient executed fund that will be providing match-making grants to IDA-financed energy projects in Africa. All grants from the CCF will follow procedures for approval of IDA projects. Annual reporting will form part of the ESMAP annual report.

The funding for the Tanzania rural water project will also be channeled as preferenced funding and be client executed for component 1 (Investment in water infrastructure) and World Bank-executed for component 2 (Feasibility Study, extensive community consultation and gender). The final project will be approved by World Bank Country Director in the Tanzania country office. Dialogue will be established directly with the WBG project team that will be responsible for submitting annual reporting to the ESMAP secretariat. The report will be validated by ESMAP and included in ESMAP's annual report and audited trust fund activities before the final annual progress report is submitted to Denmark. Due to the long-standing and trusted partnership with ESMAP, it is assessed to be sufficient to preference the funding to the project and not establish an associated trust fund. In case of changing circumstances and the project not being able to be implemented, the World Bank will inform the Danish MFA and alternative use of the funding within the ESMAP umbrella trust fund structure will be identified and potential reallocation of funds will be approved by the Danish MFA.

Finally, the support to the mapping of green jobs in Africa will also be preferenced but as a Bank-executed activity that is fully integrated in the ESMAP Business Plan. Progress will be reported as part of the results framework of ESMAP. Furthermore, it also expected that a new Danish secondment will support this work.

2.3. Strategic considerations and rationale

The Danish contribution via ESMAP to clean cooking and rural solar-powered water supply in Tanzania will aim to scale interventions towards achieving SDG6 on Clean Water and Sanitation, SDG7 on Affordable and Clean Energy, and SDG8 on Decent Jobs and Economic Growth. Furthermore, the Danish support will enhance synergy and co-benefits to improve health, gender equality, climate action and mobilizing private sector financing. The aim is to develop low-carbon solutions benefitting the poorest population and a targeted effort to leave no-one behind. It is aligned to both the new Strategy for Development Cooperation and the Danish Government's long-term Strategy for Global Climate Action and the contribution illustrates the close links between delivering on SDG6 and SDG7 and improved health conditions and broader climate action. It also contributes 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.

COVID-19 has underscored the importance of providing access to water and clean energy as both areas are cornerstones for ensuring hygiene and energy for cooling vaccines. With the support to the projects, Denmark will support an effort to Build Back Better and Greener. The objectives of the three supported interventions 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 a people-centered development that does not leave any-one behind and that can create new green jobs.

A common objective of the Danish support across the three interventions is to find new catalytic pathways to accelerate speed, scale and job creation related to green energy transition. This is done by:

- *Mobilization of private financing in Africa:* The recipient-executed interventions will be designed to use the grants as catalytic financing to leverage public and private financing in scalable blended financing schemes and as economic incentives in results-based financing mechanisms. This to achieve speed and scale on investment targeted pro-poor water and clean cooking solutions.
- *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. Map what types jobs will be created but also how many and where they will be located to ensure adequate skills.
- *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. Further, the mapping of green jobs will explore how gender gaps can be addressed.

The Danish contribution will also seek to build synergies to both bilateral and multilateral support. For the two client-executed interventions, this will done by monitoring the work closely in Tanzania but also for the first two CCF-grants in Rwanda and Uganda. All bilateral work will demonstrate innovative approaches and new pathways to mobilise additional private and public financing to clean cooking and water access. Final designs of the project is still in progress, which requires a flexible and adaptive approach to the management of the projects. An adaptive management approach will therefore be applied with a focus on continuous learning from project implementation and on achieving the greatest possible impact.

At the multilateral level, Denmark will engage as co-leader on SDG7 and other supported multi-lateral work such as the Beyond the Grid Fund for Africa (BGFA), Green Climate fund (GCF) and Sustainable Energy for Africa (SEFA). The project in Tanzania will also benefit from technical support and supervision from the World Bank's trust fund Global Water Security and Sanitation Partnership (GWSP), which Denmark has supported since 2019. Potential links to other Danish-funded interventions e.g. Danida Sustainable Infrastructure Finance, Danish research, IFU and relevant Danish companies (e.g. Grundfos) will be explored further during project implementation.

The Danish contribution to the Clean Cooking Fund contributes to a holistic approach as the Fund has been established in coordination with the 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. Further, coordination with the Clean Cooking Alliance and SPARK+ Fund supported by AfDB and IFU will also be established. Coordination with relevant bilateral countries will also be established and with relevant Danish NGO's such as CARITAS and CARE.

3. Access to water

3.1. The development challenge, strategic considerations, rationale and justification

3.1.1 Context

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 highlighted the need for access to clean water especially at rural health centers and dispensaries. Failure to address these challenges poses significant risks, including pushing millions back into extreme poverty, increasing vulnerability to 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 remains the most critical components.

Access to water, sanitation and hygiene (WASH) is a human right, yet hundreds of millions of people in Africa have no access to even the most basic of services. In 2020, global progress towards meeting SDG6 has been jeopardized by COVID-19 pandemic[3], 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.

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.[4] 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. The community-based management approach was developed for rural water supply, especially during the decades where hand pumps and other simpler water systems were prevalent. Today, more sophisticated electric pumping systems have become the norm, including water treatment, revenue collection and water pipped much closer to each household. This development requires higher level of technical and financial expertise, which often goes beyond what can be expected from a community-based organization.

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.

[3] IFC: The Impact of COVID-19 on the Water and Sanitation Sector (June 2020) UPL: https://www.ifc.org/wps/wcm/connect/126b1a18-23d9-46f3-beb7-047c20885bf6/The+Impact+of+COVID_Water%26Sanitation_final_web.pdf?MOD=AJPERES&CVID=ncaG-hA

[4] WHO. JMP: UPL: https://washdata.org/data/household#!/

3.1.2 Lessons learned

The ongoing World Bank Tanzania Accelerating Solar Water Pumping via Innovative Financing Project (2019-2021), involves a US$4.8 million grant spend across 110 villages. The project demonstrates that rural communities can pay both 40 percent of the capital investment, and the maintenance service contracts without increasing the price of water. The 40 percent is financed through a four-year loan from the TIB Development Bank to the rural water organizations. The 60 percent will be subsidized through a grant funded by SIDA and the Dutch Government via the World Bank's Global Partnership For Results-Based Approaches (GPRBA). The pilot also receives assistance from World Bank's Global Water Security and Sanitation Partnership (GWSP), which Denmark has supported with core funding since 2019. The project harnesses economies of scale both by clustering up to 50 rural villages within the same geographical proximity in one lot/contract, and by awarding the combined works and the 4-year service provision to just one contractor. This approach further benefits from standardization of equipment, remote sensing, and the long-term sustainability enhanced by an option for the participating villages to extend the service contract beyond the initial four-year service period.

In addition, the project facilitates the shift from diesel-powered to solar powered pumps which significantly reduces the life-cycle-cost of water extraction while reducing GHG emissions. The project is the first of its kind because it involves the private sector to install and maintain the solar pumping systems, including the critical pre-paid meter technology with mobile money. Through this cluster-based and performance-based contracting approach, the project seeks to enhance safe water access through water scheme rehabilitation, increased service reliability (sustainability) through private sector involvement, as well as increased revenue collection and reduced operating expenses (OPEX).

The lessons from the ongoing pilot includes:

- Rural communities in Tanzania are open to private sector led approaches
- There is a preference for solar-powered pumps, or hybrids (PV and Grid) when compared to diesel.
- A blended financing mechanisms for rural water supply is feasible and accepted by both communities and government players when sensitized through comprehensive and broad stakeholder consultations.
- The community-based water supply organizations and water users prefer pre-paid mobile money enabled water meters, which significantly increases revenue collection and reduces village-level rent seeking behavior.

3.1.3 Strategic considerations and justification

The program will contribute to larger coherence and synergies between various Danish development aid instruments e.g. bilateral and multilateral in order to reinforce a more holistic approach to Danish development cooperation. Leveraging private sector financing for the rural water supply project in Tanzania aims at contributing to a stronger link between the future Danish engagement in Tanzania and GDK around mobilizing private sector finance. Moreover, the project will benefit from technical support and supervision from the World Bank's trust fund Global Water Security and Sanitation Partnership. Potential links to other Danish-funded interventions e.g. Danida Sustainable Infrastructure Finance, Danish research and relevant Danish companies (e.g. Grundfos) will be explored further during project implementation.

Access to safe, affordable, and reliable water is paramount in the pursuit for human well-being and strengthened climate resilience. Bringing higher quantities of safe reliable water to households has several significant co-benefits including to 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%.[5] Recent evidence suggests that poor sanitation is the second leading risk factor for child stunting worldwide[6] 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.[7] Up to 43%t of stunting may be due to gut infections caused in part by poor water, sanitation, and hygiene.[8] 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 formal employment 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.[9] Considering that only 52% of the eligible student population are enrolled in lower secondary schools, it is important to promote adequate conditions both in schools and at home, especially for girls, to attain education.[10]

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 disproportionally 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

[5] 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.
[6] Guerrant, Richard. 2012. "The Impoverished Gut—A Triple Burden of Diarrhea, Stunting and Chronic Disease." https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3617052/.
[7] Petri, Naylor, Haque. 2014. "Environmental Enteropathy and Malnutrition: Do We Know Enough to Intervene?" *BMC Medicine*.
[8] Goodarz, Danaei. 2016. "Risk Factors for Childhood Stunting in 137 Developing Countries." http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002164 .
[9] World Bank. 2015. "Preparing the Next Generation in Tanzania: Challenges and Opportunities in Education."
[10] United Republic of Tanzania, Ministry of Education, Science and Technology. 2016. "National Guideline for Water, Sanitation and Hygiene for Tanzania Schools."

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. Practically this is achieved by moving rural dwellers from reliance of surface water and shallow-wells (hand pumps) to deep boreholes (60-220 meters in depth) which are less susceptible to interim climate shocks.

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.[11] 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 Theory of change and key assumptions

The overarching project outcome is to increase the sustainable access to rural water supply for households, health clinics and schools, which in turn will contribute to the overall improvement (impact) of quality of life, gender equality and health of communities. The project aims to achieve this objective by supporting the following four main results areas: i) Improving the technical sustainability (reduce breakdown) of rural water schemes; ii) Strengthening the financial sustainability of rural water schemes; iii) Financing and facilitating the rehabilitation of dilapidated rural water supply schemes; and iv) scaling private sector financing mechanisms through Public Private Partnerships. The project will focus on sensitizing, consulting, and training of rural villages along with a close participation of government officials and local decision-makers. The project will be voluntary and present an "opt-in" option for full ownership by the rural communities. An emphasis will be placed on menstrual hygiene management where a pilot on high-quality, antimicrobial, and reusable female sanitary pads, will seek to setup an in-country production, create female employment and demonstrate a sustainable financial mechanism for scale.

The theory of change is included in Annex 3, which also contains answers to the standard questions in the Danida Aid Management Guidelines. Annex 3 also includes the results management framework containing both outcome and output indicators as well as process output indicators to enable monitoring of progress towards completion of tender documents for the water schemes.

[11] UN Population Division. 2017. "World Population Prospects." https://esa.un.org/unpd/wpp/.

3.3 Project objective and components

The project objective is contribute to the overall improvement of quality of life, gender equality, climate resilience and health of vulnerable communities through increased and more sustainable access to rural water supply for households, health clinics and schools. The project will seek to consolidate and build on the achievements of the ongoing World Bank Accelerating Solar Water Pumping via Innovative Financing Project (described in section 2.3.1), 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. Compared to the ongoing first phase of the project this new Danish-funded 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 15-year loans/concessions
3. Moving from tenders with 50 villages to 200-500 villages per lot as described below (increased economies of scale)
4. Increased the responsibility and risk taken by the private sector
5. Moving from the current 40 percent private sector financing to above 60 percent
6. Demonstrate whether the water tariff in rural communities can finance reusable sanitary pads

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 15 year service agreement or concession. The average cost of a solar pumping system is estimated at US$60,000, of which the Danish grant based subsidy will cover approximately US$ 24,000 (40%). US$ 36,000 (60%) and the Project Selected Private Companies will bear the remaining through the 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 to investment in water infrastructure and US$ 36,000 per Solar Pumping (PVP) System that is covered under 40% CAPEX subsidy, the grant expects to result in 206 new PVP systems in rural Tanzanian villages or small towns. It is important to note that the cost include a 15 year service agreement (concession) with the Project Companies, which has been factored in the CAPEX estimate. The grant financing will cover the CAPEX subsidy but the long-term service contracts will be covered by the private sector. The service cost will be included in the bidding process as a required part of the proposals and be secured by a performance bond. 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. The feasibility studies will also apply a holistic water cycle approach to ensure that sufficient groundwater will be available for increased water supply and with the expected impacts from climate change and as such contribute to long-term sustainability of project investments. Systematic test pumping of all sites will be required to ensure that the project activities will not lead to groundwater depletion. Furthermore, the project will

introduce continuous remote monitoring of groundwater levels in all supported boreholes and support RUWASA with capacity building and dashboard development to enable easy monitoring of groundwater levels. This is not currently practiced in Tanzania. 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.

Capacity Building

The project will naturally support RUWASA on capacity building related to groundwater monitoring, solar water pumping, pre-paid meters and efficient community consultation. However, the most significant capacity building element, will be on working with RUWASA to demonstrate and mainstream PPP approaches that can leverage significant private sector financings. This capacity is currently yet to be developed and mainstreamed.

Gender subcomponent on Menstrual Health and Hygiene[12]: A global Menstrual Hygiene Management (MHM) 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[13]"* 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 challenge 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 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 dropouts and work absenteeism.

II. **Financing:** The project will through a subsidy or equivalent incentive enable 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

[12] MHH is important for the fulfilment of girls' and women's rights, a key objective of the Sustainable Development Goals (SDGs). Women and girls' access to MHH is a component of gender-responsive WASH services; SDG 6.2 acknowledges the right to menstrual health and hygiene, with the explicit aim to, *"By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations"*. Without considering needs for safe and dignified menstruation, the world cannot achieve the vision for sanitation and hygiene under Goal 6

[13] 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.

Organization (CBWSO) that will make this arrangement possible. Most CBWSOs currently have gender balance (50%) as per the policy. RUWASA's role in this MHM activity, will be i) raising awareness through RUWASA's district offices, ii) compile a list of interested villages, iii) facilitate one procurement for a contractor to provide: capacity building, supply of pads, distribution and training over a 3-year period across a cluster of villages in a specific geographical area (region) of Tanzania.

PPP Approach: The PPP approach is planned to include a 15-year 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 most of the investment through revenues from sale of water. The Project Selected Private Companies have a financial interest in running and operating the water schemes as long as possible as it is the revenue from water sales (continued operation), which will make their investment profitable. The majority of the Danish funding will be used to subsidize or buy down the risk of 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 and through an adaptive management approach.

PPP Risks: Through initial market sounding consultations, key risks that could severely affect the attractiveness of the project has been identified.

- **Political and regulatory risks**: The political stance on water tariff poses a risk to private players. This risk can be mitigated by: a guarantee mechanism, strict contractual clauses and penalties.
- **Currency risk**: Fluctuation in the exchange rate of the currency in which the debt finance is availed is a common yet significant risk.
- **Payment risks**: When the private sector firms receive payment from a government agency, there is a risk of delayed payment/non-payment for the services provided. A payment guarantee or grant support financed by DANIDA could mitigate this risk.

Overall risk mitigation strategy: The Danish grant will support the project with risk mitigation measures, which will increase the overall bankability of the project. The pre-feasibility study of this PPP have been concluded in June 2021, and it is expected that the subsequent and planned feasibility study comprehensively will explore and recommend the most optimal way to leverage the Danish grant to make the project bankable. Consequently, the project will adopt an adaptive management approach where certain key project design decisions will be made during the project implementation. The Tanzanian Government will also bear some of the financial risk, which will be one of their key contributions to the PPP.

Performance Bond: Performance bonds will be including in the PPP tenders, which will provide significant monetary penalties to poor or none-performance of the private sector investor/operator. The same is currently being used in the ongoing pilot.

3.4 Summary of the results framework

The project aims to provide at least 700,000 rural residents with basic access to sustainable water services through improved solar water pumping systems. The project will target rural villages and can support green-field investment in water infrastructure (new), extension of existing schemes and rehabilitation of existing

water schemes. The village water committee (CBWSO) will voluntarily participate in the PPP and will voluntarily agree to the 15-year concession which will include having their pumping systems hybridized with solar power, meaning that the pump can run both on solar and the grid. The water infrastructure will be financed by a 40% subsidy covered by the Danish contribution. The subsidy may be lower depending on the results of the PPP competitive tenders and may be modified to a risk guarantee mechanism.

Project	Leveraging private sector financing for rural water supply in Tanzania
Project Objective	The project objective is contribute to the overall improvement of quality of life, gender equality, climate resilience and health of vulnerable communities through increased and more sustainable access to rural water supply for households, health clinics and schools.
Impact Indicator	Number of people with basic and sustainable access to rural water supply

Outcome 1		Investments in water infrastructure	
Outcome indicator		Rural residents basic access to sustainable drinking water increased	
Baseline	Year	2021	0 (Communities have access to water but not available when needed and with significant price variation in the dry season)
Target	Year	2025	700,000 people of which 50% is female with access to basic drinking water service (JMP criteria).

Outcome 2		Gender sub-component on menstrual health and hygiene	
Outcome indicator		25,000 girls and women in selected villages manage their menstruation with increased safety and dignity	
Baseline	Year	2021	Safe female sanitary pads are unaffordable to a large majority of the female rural population, especially the female student population.
Target	Year	2025	25,000 girls and women

4. Access to clean cooking

4.1. The development challenge, strategic considerations, rationale and justification

4.1.1 Context

Support to clean cooking will target important areas of climate, gender and health impacts. Lack of clean cooking fuels and technologies - such as improved cook stoves, electric cookers and clean fuels, e.g. electricity, biogas, ethanol, solar and briquettes - result in severe health, gender, economic, environmental, and climate impacts. Household air pollution (HAP) from cooking with traditional solid impacts

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 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 and an increasing variety of market providers for clean cooking.

Support to clean cooking will target important areas of climate, gender and health impacts. Lack of clean cooking fuels and technologies - such as improved cook stoves, electric cookers and clean fuels, e.g. electricity, biogas, ethanol, solar and briquettes - 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.

4.1.2 Lessons learned

Past clean cooking programmes have tended to focus on low-tier and one-size-fits-all cooking solutions, which often has resulted in low adoption rates. Further, many programmes have not been support by national policy framework and sufficient resources to promote modern-energy cooking solutions. There has also been little progress on standard-setting for cook stoves and to promote consumer/producer incentives to stimulate adoption of clean technologies. Finally, many of the past experience has not adopted a holistic systemic approach that combines a deep understanding of the specific geographic context and differences in cooking behavior, culture, resources, institutions, and market access conditions.

The Clean Cooking Fund therefore promotes a more whole-system of interactions of cooking technologies (the combination of stove and fuel) with human behavior (e.g., what to cook, how to cook, and how often and long to cook), housing conditions (e.g., kitchen location, arrangement of rooms and size, construction materials, and quality of ventilation) and affordability (what type of fuel, price competiveness, urban/rural, etc.). It is important combine technological innovation, behavioral change, collaboration across stakeholders and market access in order to be adaptive to the local conditions.

New trends in technology and business models provides new opportunities but also increasing fuel costs and greater distances being travelled to collect fuelwood makes the value proposition for consumers more evident. This allows for better messaging and marketing campaigns that can lead to higher adoption rates than in the past. However, it should also be recognized that fuel switching in rural areas is likely to be slower in rural economies until public funding is provided for fuel switching. In these areas, the modernization of the biomass fuel sector should promote integrated and cost-effective approaches such as improved/advanced biomass stoves, improved ventilation and behavior change.

A transformative approach to clean cooking will also require political high-level support is essential to scale up access to modern-energy cooking services. Particularly, there is a need to support market mechanism to overcome affordability and other constraints that affect mainly poor households. This will include effective subsidy allocation mechanisms to mobilize and sustain private-sector participation and target households who have an affordability gap. In this regards, the Clean Cooking Fund will also build on World Bank experiences applying Results-Based Financing frameworks to support clean cooking solutions in 10 client

countries. The results demonstrate that Results-Based Financing is an effective instrument to incentivize private-sector investment and deliver clean and efficient cooking

4.1.3 Strategic considerations and justification

Clean cooking is key to achieve SDG 7 on clean energy but it also an enabler 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 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 to climate change[14]. Further, burning and collecting firewood in semi-arid areas also contributes to rapid deforestation and ecosystem degradation. Approximately one-third of wood fuels 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 and financial support. 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.

Usage of gas and LPG for clean cooking. Denmark will through its support to CCF support the Nordic-Baltic Constituency's (NBC) approach to energy investments in the World Bank Group. Currently, it means that use of LPG/gas for clean cooking may be considered in IDA-only countries based on existing gas infrastructure and where no alternatives are available. There exist a high degree of divergent opinions related to usage of LPG/gas for cooking due to the health and environmental impacts of usage of biomass. Dialogue is ongoing

[14] 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.

and the Danish support to CCF will follow the official Danish position. It means that we will use our voice and influence in CCF and ESMAP but cannot rule out support for LPG/gas cook stoves.

4.2 Theory of change and key assumptions

The objective 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 promoting clean and renewable energy sources, incl. electricity or biogas or improved alternative fuels, including ethanol, briquettes, and pellets. The fund measures 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, providing program- and pillar-level outcomes and indicators, with each funded country-level activity having its own Results Framework linked to it. The Danish support will be targeted to Sub-Saharan African countries.

The theory of change is described in Annex 3, which also include the results management framework for the CCF which is an integrated part of the ESMAP results framework.

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 political commitment and financial gap for clean cooking. The current challenges of scaling clean and affordable energy solutions for cooking by providing economic incentives to attract private sector investments and innovation in the clean cooking sector. Further, the catalytic grants and technical assistance will increase political commitments to develop adequate policy frameworks and at least be able to double the project budget for clean cooking in each supported country.

The CCF also builds on the assumption that consumers prefer quality products that are a significant improvement over traditional cook stoves. With increasing fuel costs and greater distances being travelled to collect fuelwood due to scarcity, the value proposition for clean cook stoves is getting stronger and aligns with consumer motivations for acquiring them in the first place. Further, to achieve adequate health benefits, the CCF will only support clean cooking solutions that meet Tier 3 in the Multi-Tier Framework (MTF) for cooking also has a tiered approach with reference to ISO VPT[15] tiers on emissions and efficiency and above following the VPT or at least two tiers above the established baseline. Exception will only be made if a strong case is made based on country-specific conditions.

4.3 Project objective and components

The Clean Cooking Fund has been established as an innovative fund with the goal of accelerating progress toward universal access to clean cooking by 2030. The Fund aims to mobilize political commitment and financing to attract private-sector and multilateral investments in the clean cooking sector. Further, it will

[15] The International Organization for Standardization (ISO) has published ISO/TR 19867-3:2018 ISO Voluntary Performance Targets (VPTs) on cookstoves' thermal efficiency, carbon monoxide (CO) emissions, fine particulate matter (PM 2.5) emissions, safety, and durability.

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 business innovation across the clean cooking value chain, and to provide results-based grants to bridge 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 Multilateral Development Banks and additional private sector financing will be leveraged. The pillar is also providing capacity building, technical assistance and support for project preparation. Rwanda was the first country to receive funding from the Clean Cooking Fund but a pipeline of World Bank IDA-projects are ready to utilize the grant component for the Clean Cooking Fund, incl. projects in Uganda, Burundi, Ghana, 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 to 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 Clean Cooking fund 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.

4.4 Summary of the results framework

The Danish contribution to the Clean Cooking Fund is estimated to contribute to providing approximately 500.000 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. The clean cooking component of the planned Uganda Electricity Access

Scale-up Project is expected to be one of the countries benefitting from the Danish support, and the project will be used as a proxy indicator to monitor the number of people benefitting from accessing clean cooking. Overall monitoring of results of the Clean Cooking Fund will be made through the annual ESMAP results-framework.

Project	Support to the Clean Cooking Fund
Project Objective	The objective of the CCF is to scale up access to clean cooking, measured as the increased number of people in client countries with access to clean cooking
Impact Indicator	Number of people who have gained access to clean cooking

Outcome 1		Improved access to clean cooking in client countries	
Outcome indicator		Number of people who gained access to clean cooking resulting from financed projects	
Baseline	Year	2021	N/A (no previous support from the CCF)
Target	Year	2025	100 million people

5. Mapping the Job Creation potential of Renewable Energy

5.1. Context and development challenge

Africa's working-age population is estimated to grow by 450 million people towards 2050 but is only likely to produce about 100 million new jobs without significant policy reforms. On average only 3 million jobs are created per year, and this might even be lower due to the impacts of Covid-19. Africa is simply not creating enough jobs to absorb the 10 million to 12 million young people entering the labor markets each year.

Renewable energy has a demonstrated job creation effect. For example, energy created through solar PV has a higher number of jobs created per unit of energy produced than energy produced through conventional fossil energy sources. The positive job creation effect of renewable energy is a result of longer and more diverse supply chains, higher labour intensity, and increased net profit margins. Particularly in Sub-Saharan Africa it has an enormous potential as less than half the population has access to electricity today. The potential of green jobs needs to mapped to demonstrate the future possibilities for employment in the sector[16].

Jobs in renewable energy can be created directly and indirectly along the entire value chain, including in the manufacturing and distribution of equipment; extraction and processing of minerals; or even in services like project management, installation, operation, and maintenance. Improved energy supply through renewable sources can also contribute to the expansion of existing economic activities in other sectors such as agriculture where particularly women and the youth can benefit from job increases.

IRENA estimates that globally up to 100 million people will be employed in the energy sector by 2050 compared to 58 million today. Of these, 42 million jobs will be created in renewables, 21 million in energy efficiency and 15 million in power grids and energy flexibility. New jobs in green transition-related technologies and sectors are expected to outweigh job losses in fossil fuels and nuclear energy. However, jobs will be lost in some sub-sectors, namely those related to fossil fuels. The effects will vary depending on the factors at play in a given region but ILO estimates that approximately 70% of lost jobs in the fossil fuel

[16] Green jobs is defined by ILO as decent jobs that contribute to preserve or restore the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency

industry could be absorbed by the renewable energy sector by up-grading skills of workers. Public and private investment in adequate skills and qualifications will contribute to open new decent and green job opportunities and by this support a just green transition process.

The current information deficit is that the above projections often are extracted and builds on data from developed countries. Further, in many least developed countries, the provision of energy to energy poor regions (households and industries) can boost economic activity and job creation in the broader economy. At the same time, the retirement of coal-fired power plants or coal mine closure may also result in job losses, which must also be accounted and managed appropriately as an integral part of the global decarbonization agenda.

The proposed work will explore the job creation potential related to the transition to renewable energy and closing the energy gap in a developing country context. The findings and insights from the studies will be used to produce recommendations, guidance and pilots on how to integrate job creation as key outcome in energy projects.

5.2. Strategic considerations, justification and rationale

The possibility of accelerating the green energy transition will in many developing countries depend on the ability to develop a "just transition" in the form of an inclusive and people-centered approach where no-one is left behind. In particular, political disruption such as local job losses and economic slow-downs are key barriers that needs to be addressed. In this regard opportunities to increase employment opportunities will be paramount and more information is needed to understand where new green jobs will be located, what skills will be requested and spill-over effect to other sectors. The proposed analytical support to ESMAP will not only contribute with new insights but also produce guidance to strengthen policies to maximize the green job creation potential.

Denmark's new Strategy for Development Cooperation emphasizes that access to clean and renewable energy for more people in Africa is a key building block to facilitate social and economic development as well as green and decent job creation. It is also underscored that Denmark will contribute to a sustainable and socially just economic recovery and green transition after the COVID-19 crisis, with an emphasis on the creation of opportunities for young men and women. The Strategy also highlights the importance of creating prosperity and opportunities through decent jobs and green growth that benefits everyone and draws on the strengths of the Danish business sector and the social partner organisations. At the heart of this work is technical training and re-skilling of qualifications that can support green transition and job creation. The Danish support to ESMAP will contribute to a mapping of the different types of decent green jobs and skills needed in the energy transition process, which can be included in the World Bank Group lendings and operations. By this, the Danish support will be targeted to strengthen ESMAP's socio-economic work.

The Danish support is also well aligned with the Danish Long-term Global Strategy for Climate Action. It emphasises that Denmark will support a just green transition that creates skilled jobs – particularly in developing countries – and does not increase inequality. Further, it also supports the Danish support of Building Back Better and Greener in the midst of the Covid-19 pandemic. Governments are implementing massive fiscal stimulus programmes that can stimulate economic growth and employment. A major concern

is if these stimulus packages are not contributing to an inclusive low-carbon future, but rather are locking countries into a fossil fuel business-as-usual scenario.

The mapping of decent green job creation will contribute to accelerating SDG 7 on Affordable Clean Energy and SDG 8 on Decent Jobs and Economic Growth. It will do so by exploring the potential number of jobs that can be created by "green" energy sector investments. It will also investigate what type of jobs, e.g. local/national levels, skilled/ semi-skilled, temporary/permanent jobs generated. The Danish support to ESMAP will provide resources to develop new insights on how to integrate a systemic "job-lens" in future renewable energy projects.

5.3. Theory of change and key assumptions

ESMAP's knowledge work and technical assistance on green job creation is designed to explore how the green energy transition can boost economic growth and employment opportunities. It is planned to publish findings in flagship report and turn it into ESMAP sector advisory and also incorporate job creation as clearer target in new World Bank energy lendings where client countries find it relevant.

Increasing ESMAP's focus on job creation was proposed by the independent Technical Advisory Group (TAG) which provides independents advisory to ESMAP. The focus on job creation is included in ESMAP's Business Plan 2021-2024 as part of the renewable energy support to countries to leverage bidding processes to reap socio-economic benefits of renewables deployment, including jobs. Job creation and re-skilling is also a key consideration in ESMAP's support for the coal transition. Progress on these aspects will be presented in ESMAP's annual reporting on results and will be integrated delivery in ESMAP's Theory of Change (see annex 3)

The need for further insights of job creation related to energy transition builds on the assumption that more knowledge is needed to seize the opportunities to maximize job creation and ensure broad public support to the energy transition. It will be critical to demonstrate to citizens and policy-makers which type of new jobs will be demanded and where potential job losses will occur. Once this information is better understood, it will be possible to integrate different types of job creation (direct, indirect and induced) in energy planning and complementing this with adequate skills-building and re-skilling of jobs in the conventional energy sector and by this contribute to a "just energy transition".

5.4. Project objective and components

The overall objective of the work related to job creation is to "build understanding on how the energy transition - while advancing the global decarbonization agenda - can also contribute to the generation of jobs and support economic activity (including a 'green' recovery from the COVID-19 induced downturn)". The Danish contribution will be geographically preferenced to Sub-Saharan Africa for country cases and technical assistances.

The scope is explore the direct and indirect backward spillover employment effects for renewable energy technologies, as well as potential induced employment effects. An important focus will be the latter. This is particularly the case for developing countries, where these effects are conceivably largest, given the constraints imposed by inadequate quality and quantity of power that are improved by energy interventions such as those supported by World Bank Group projects and investments.

The Danish support will be prefenced to the ESMAP work stream related to the strengthening of knowledge to strengthening consideration of decent job creation potential related to the green energy transition. It will be divided in two overall components:

Component 1: Flagship report and country cases
This component will examine what jobs and employment opportunities that can be directly attributed to investments supporting the energy transition and/or associated policy reforms. Also, what kinds of co-benefits do these investments generate in terms of female employment, economic growth but also requirements for skills-building and re-skilling to meet employers' requirements for the workforce and to promote decent jobs. It will analyse the policy and regulatory changes but also fiscal measures (tax/subsidy and public spending/investment) that enable or facilitate changes in employment under the energy transition and policies necessary for these jobs to materialize. A three-pronged approach is proposed to shed light on the job creation potential of the energy transition:

- *A literature review* to understand how economic theory and existing empirical studies assess the impact of policies, regulations and investments supporting the energy transition on employment outcomes. It will seek to understand findings on the short and long run impacts on employment, employment income, wages, or net jobs created.
- *Application of computable equilibrium modelling* to estimate the economy-wide macroeconomic effects and net jobs potential of energy sector investments and policies underpinning the energy transition. This activity will also be linked to estimate the potential of a post-COVID green recovery to create new jobs and increase economic growth potential, particularly in Africa.
- *Country case studies* of job creation (direct, indirect, and induced) associated with the energy transition will be identified and elaborated, incl. Rwanda and Nigeria. The case studies has a dual objective: (i) to provide a contextualized "reality check" to complement the findings and conclusions of the literature review and general equilibrium modelling; and (ii) to provide recommendations and guidance for World Bank task teams working on energy sector projects on how to explicitly incorporate job creation in project design and implementation.

Component 2: Incorporate decent and green job creation in energy project designs
The findings of the report and country case studies will be summarized in reference material for World Bank operational teams on how to design theories of change for energy projects that incorporate support for employment generation as an explicit objective (accompanied by the corresponding results measurement framework).

The study will also inform ESMAP's work with countries to design socio-economic roadmaps, local value chain strategies and technology-specific and social frameworks for emerging technologies to bring forward the local benefits of job creation related to green energy transition. This also includes strengthening women's participation and employment opportunities in the energy sector.

Relevant World Bank energy projects under preparation will also be targeted to incorporate job creation as an objective with a corresponding results framework. Projects in the Energy and Extractive Global Practise within the World Bank will be targeted.

Project	Mapping Green Energy-related job potential
Project Objective	The project objective is Build understanding on how the energy transition - while advancing the global decarbonization agenda - can also contribute to the generation of jobs and support economic activity (including a 'green' recovery from the COVID-19 induced downturn).
Impact Indicator	N/A

Outcome statement		Energy sector projects systematically consider job creation as an objective with a corresponding results measurement framework	
Outcome indicator		# of energy projects incorporating job creation in project design and results framework	
Output indicator 1.1.		One international flagship report published	
Output indicator 1.2		At least two country cases from Africa produced	
Baseline	Year	2021	N/A
Target	Year	2024	At least two WBG energy sector projects under preparation incorporate job creation as an objective with a corresponding results framework.

6. Budget

The funding of three preferenced engagement will channeled through ESMAP. It is the anchor multi-donor trust fund for the World Bank energy and follows the new and more flexible 'Umbrella 2.0 program' for trust funds (see also chapter 2.2). The Danish funding will be allocated as preferenced grants targeted to the Clean Cooking Fund (DKK 41.0m), the rural water supply project in Tanzania (DKK 41.0m) and green job creation (DKK 4.55).

Overall budget	**DKK (million)**	**USD (million)**
Engagement 1: Access to water in Tanzania	**41.00**	**6.53**
Component 1.1: Investment in water infrastructure	31.00	4.94
Component 1.2: Feasibility Study, Extensive Community Consultation and Gender	8.00	1.27
Contingencies (5%)	2.0	0.32
Engagement 2: Access to clean cooking	**41.00**	**6.53**
Output 2.1: Clean cooking country investments in Africa	37.00	5.89
Output 2.2: Global knowledge and innovation	4.00	0.64
Engagement 3: Job creation and renewable energy	**4.55**	**0.72**
Programme management	**8.45**	**1.34**
Project supervision and support (4%)	3.70	0.58
Management fee (5%)*	4.75	0.76
TOTAL	**95.00**	**15.14**

USD exchange rate (September 2, 2021): 6.2759

**Fixed percentage applied to recipient-executed grants*

7. 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.

Reporting: ESMAP has developed a comprehensive and standardized reporting system, which provides continuous updates and standardized reports to the Danish MFA. Specific reporting requirements for the two engagements including annual progress reports will be specified and confirmed in the confirmation letter from ESMAP upon signing the amendment to the existing administrative agreement between Denmark and ESMAP. In addition, 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. Any unspent balance or any savings of project funds shall be returned to the Danish Ministry of Foreign Affairs.

7.1 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, 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.

Project partners will conduct Implementation Support Missions twice a year and findings will be included in aide memoirs to be submitted to GDK and the Danish Embassy in Dar es Salaam, Tanzania. On request, the Danish Embassy or GDK can also participate in these Implementation Support Missions.

7.2 Clean Cooking

The Clean Cooking Fund has been operational since 2020 and managed by ESMAP as a dedicated global program. The Clean Cooking Fund will therefore be able to fully utilize ESMAP's well-established governance structure, 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 donors to the Clean Cooking Fund 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. ESMAP also has established 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 2021-2024.

The CCF will prioritize its funding support based on the following key criteria: (i) high-impact countries identified in the SDG 7 tracking report, (ii) IDA co-financing leverage ratio, (iii) sector-wide programmatic approach, and (iv) high-level political support. In practice, it means that ESMAP and CCF will provide technical support in the preparation process and identify relevant IDA energy projects that can receive grant financing from CCF and Donors will be kept informed regarding progress and pipeline development. However, as the CCF is a recipient-executed associated trust fund to ESMAP, the approval of grants will in will be integrated the approval process IDA-projects. This means that the formal approval of CCF financing follow IDA procedures for approval which will be done by the Board of Directors for World Bank's International Development Agency.

7.3. Job creation

The support the new work on job creation related to the green energy transition will be integrated in the ESMAP managed and executed knowledge and analytical work. Annual narrative and financial reporting will fully integrated in ESMAP reporting and follow the World Bank's procedures for Trust Fund management.

8. 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.

8.1 Water

It is anticipated that the private investor will bear a large portion of the operational risk while the Government will merely cover parts of the payment risk. The main risk to the project, is the Government's willingness to participate in a PPP-like scheme. As mentioned in section 5.1, there are several risk associated with the PPP approach, namely: i) Political and regulatory risks; ii) currency risk; and iii) payment risks: Other broader risks include: i) change of political support for PPP transactions; ii) conflict over water sources; and iii) underperformance of the private sector. See Annex 5: Risk Management Matrix.

8.2 Clean Cooking

Given the complexities of the clean cooking sector and the interplay between environmental, health, social, and economic benefits, the Clean Cooking Fund is considered a high-risk, high-reward initiative. Reducing and managing risk will require that the Clean Cooking Fund 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. The Clean Cooking Fund has reviewed of result-based financing mechanism to design Results-based financing tools to fit maturity of markets, targeted specific impacts, value chain entry-point and allow for flexible and responsive designs that are adaptive to the evolving market conditions.

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 a general commitment from the World Bank to provide complementary 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. See Annex 5: Risk Management Matrix.

8.3. Job creation

Risks related to this component is considered relatively low as all activities will be executed directly by ESMAP. The risk to achieve the planned outcomes is also considered relatively low as interest already exist from several World Bank client countries and adoption of recommendation is mainly targeted World Bank energy lending projects. Further, extensive dissemination of the findings of the activity is planned and development of guidance material on the topic for World Bank staff in the Energy and Extractive Global Practice.

Annex 1: Context Analysis

1. Clean cooking

Overall Development Challenges, Opportunities and Risks

Approximately 2.6 billion people, 34 percent of the global population, lacking access as of 2019, and to an additional 60 million of population growth and other demographic changes through 2030. This is particularly urgent as these people's health is severely threatened by the household air pollution (HAP) caused by their continued cooking with traditional fuels and stoves. HAP from this kind of cooking has been linked to at least 4 million premature deaths per year from non-communicable diseases (including heart disease, stroke, and cancer), as well as childhood pneumonia. In addition, these people's productivity is deeply diminished by the hours spent gathering fuel each day. The estimated cost of damages associated with traditional cooking fuels and stoves is over USD 2 trillion per year, of which 1.4 trillion is related to health impacts and 0.8 trillion is borne by women in the forms of poor health and safety, as well as lost productivity. In addition, fuels sourced from non-renewable biomass contribute to environmental degradation and adverse climate impacts, estimated at USD 0.2 trillion per year.

The annual rate of access to clean cooking fuels and technologies from 2010 to 2018 increased by less than one percentage point as population growth outpaced the number of those with access. In the decade leading up to 2030, increases in excess of 3pp per year are required to achieve the goal of universal access to clean fuels and technologies by 2030. Particular in Sub-Saharan Africa, progress is slow, where a stagnant access rate (annualized increase of 0.4 percent point) combined with rapid population growth have meant that the numbers of people without access have risen from 750 million to almost 900 million in 2018.

The slow progress reflects to deliver on clean cooking partly reflects that interventions and solutions have often been not fully responsive to the underlying needs of lower-income and rural households. In many countries, this situation is driven by a combination of high up-front capital costs, low household awareness and unavailability of clean fuels – due in part to underdeveloped infrastructure. Most clean-fuel gains can be attributed to large, government-driven fuel transition programs, but uncertain availability and perceived affordability of clean solutions set against readily accessible dirty, biomass fuels exacerbate the access challenge. Even in rapidly urbanizing settings, users make behavioural trade-offs with their time, health, and safety and continue to use the accessible, affordable traditional cooking alternatives.

The complexity and fragmentation cooking ecosystem, e.g. rural-urban differences, has often hindered advancement. But more effective strategies for clean cooking interventions are gaining momentum. There is growing consensus on the importance of the cooking sector and increasing policy prioritization at global and country levels, particularly due to adoption of the SDGs. Platforms such as the Health and Energy Platform of Action (HEPA) bring in technical expertise and high-level dialogue across the relevant, but traditionally siloed, sectors of energy, health, climate, industry, finance, rural and urban development, gender and social protection. There are new technologies, business models and financing mechanisms – including some from off-grid electricity access efforts – that enhance the affordability of solutions, using high-efficiency cooking appliances and digital and PAYG technologies. There is a better understanding of household cooking energy needs and sector dynamics, as well as the need to integrate clean cooking with electrification planning, thanks to new data and research.

The Results-Based Financing has been demonstrated to be an effective approach to promote clean cooking by using public resources to incentivize the market and can be designed to fit the country context and market conditions. The World Bank has implemented the Results-based financing in 10 client countries with variations based on country conditions. The results demonstrate that Results-based financing is an effective instrument to incentivize private-sector investment and deliver clean and efficient cooking and heating solutions with pre-defined result levels and triggers for payment. The flexibility allows for designing and adjusting the pre-defined results and associated incentives based on the country context, market conditions, and feedback from program implementation which is important for global funding mechanism. It also allows for unlocking market development targeted poor and unserved population.

The risk of the promoting the clean cooking fund is a continuous lack of high-level political commitment to develop policy frameworks at the national level and leverage international and public funding. Further, Result-based financing mechanisms must be careful not to distort the market in an attempt to introduce new technologies and stimulate demand, and a carefully designed exit strategy should be developed. Further, cross-sector coordination to prevent duplication, meet broader needs (e.g. pre-financing), and increase learning and cooperation. Finally, it will be important to ensure regulation to ensure certification and standards for eligible stoves to align and maintain market quality standards.

One of the expected projects to benefit from funding from the Clean Cooking Fund is the *Uganda Electricity Access Scale-up Project*. In Uganda, over 90 percent of the population still uses wood fuels for cooking. The demand for these fuels will remain strong in the foreseeable future, and fundamental barriers still remain to the scale up of clean cooking options and nation-wide distribution. The planned activities in this project will build on lessons learned and implementation approaches from the Clean Cooking Supply Chain Expansion Project from 2017-2020. The project components include (i) a credit line to extend working capital to eligible companies offering efficient cookstoves and clean fuel technologies, (ii) Results-based Funding grant incentives designed to support clean cooking business development which targets high-performance technological solutions, innovative business models, or particularly challenging market segments with verified outputs, (iii) support will be provided for scaling up access to clean cooking solutions for public and private institutions (for example, schools, hospitals, and prisons), which rely heavily on biomass for cooking, thereby contributing to biomass sustainability problems, (iv) support an enabling environment through policy development and technical assistance, e.g. improved fuel/stove quality standards, tax/tariffs, consumer awareness campaigns, etc.

Rwanda was the first country to receive funding from the Clean Cooking Fund. Rwanda's slow progress on access to clean cooking reflects its high dependence on solid biomass for meeting household cooking needs, with 80 percent reliant on firewood and 17 percent on charcoal. More than half of Rwanda's households use three-stone fires for cooking. The country's high population growth and density have exerted pressure on natural resources, especially forests. As part of the Rwanda Energy Access and Quality Improvement Project, a sub-component focusing on increasing Access to Clean Cooking Solutions has been established to set up a Results-based Financing window to provide cash incentives to attract private sector investment and deliver eligible clean and efficient cooking solutions with a predefined results level and triggers for payment. Another

sub-component providing Technical Assistance, Institutional Capacity Building and Implementation Support to support an enabling environment for clean cooking sector development is also included.

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.

Yet, the first year since the launch of the Clean Cooking Fund only three donors have made pledges demonstrating the continuous lack of political commitment. On the positive side, several countries are beginning to established more adequate policy frameworks to promote clean cooking and new era of private sector stakeholders are emerging integrating financing and access to clean fuel and technology.

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. This can encourage closer collaboration with relevant humanitarian and civil society organisations such Danish Refugee Council, CARE and Caritas but also private sector stakeholders such as Phesithos eCooker developed, tested and produced with refugees in Uganda.

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 cooking 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 spend of 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 discussions whether use of liquefied Gas (LPG) should be promoted as 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., CO_2 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 tCO_2e linked to SLCPs like black carbon (BC) emissions are part of the Results-based financing 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 World Bank 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 with accessing finance 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 Clean Cooking Funds's support for quantifying and making payments against verified impact-level climate results will support the possibilities for country-driven clean cooking initiatives to continue to receive carbon off-set payments against impact-level climate outcomes quantified in all other GHGs (as well as their tCO2e). Though this is a minor part of the total efforts of the Clean Cooking Funds, the access to carbon markers serves a way of demonstrating verifiable GhG reduction from clean cooking and the payments adds a much needed subsidy element.

Denmark will specifically advocate for promoting use of sustainable biofuels and electricity. Though support to LPG and gas could be considered in specific context by the countries receiving support from the Clean Cooking Fund, this should not promoted as a first option and as the main energy source for rolling out extensive clean cooking programmes. Further, if LPG and natural gas is promoted, it should be through an infrastructure development that could be replaced by biogas or ethanol in the future.

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. 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. 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 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.

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 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 percent, with large regional disparities ranging from 15 percent in Dar es Salaam to 56 percent in Rukwa region in western Tanzania, as illustrated in figure 1. Stunted children are shorter, more susceptible to disease, and more likely to have poorer cognitive and educational outcomes. 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 percent less than their peers. Some estimate the overall GDP losses from stunting at 4–11 percent.[17] Recent evidence suggests that poor sanitation is the second leading risk factor for child stunting worldwide[18] and that diarrhea and chronic environmental enteropathy (intestinal inflammation) in children are linked to a lack of sanitation and have a

[17] 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.

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

significant impact on childhood development.[19] Up to 43 percent of stunting may be due to gut infections caused in part by poor water, sanitation, and hygiene.[20]

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.

Sectoral and Institutional Context

Water Sector Development Program (WSDP). In 2006, Tanzania launched its ambitious WSDP for 2006–2025, encompassing the entire water sector, from water resources management (WRM) to urban and rural water supply and sanitation. In line with the emphasis on decentralization of the 2002 National Water Policy (NAWAPO), the first phase of the WSDP (WSDP-1, 2006–2015) delegated the construction of new water schemes to the 185 Local Government Authorities (LGAs) and scheme management to village-level autonomous Community-Owned Water Supply Organizations (COWSOs). COWSOs own the water supply schemes but can delegate their operation to a third party. WSDP-1 received more than US$1.4 billion in funding, of which US$367 million (26 percent) came from the Government of Tanzania (GoT), while US$1,033 million (74 percent) came from development partners (DPs) through a sector-wide approach. The rural water supply component received US$560 million but only US$24.2 million (less than 2 percent) was allocated for rural sanitation. According to the GoT, WSDP-1 provided access to improved water supply to over 10 million people and 5.1 million gained access to improved sanitation; both outcomes exceeded set targets.[21] WSDP-2 commenced in July 2016 and may benefit from the National Water Investment Fund (NWIF) that was recently created to finance investments in rural water supply.[22] The Implementation Completion and Results Report (ICR)[23] for WSDP-1 found that "achieving sustainable water service delivery continues to be a major challenge." Lessons from implementation showed that there is a need to consider different management models that can address the shortcomings of COWSOs. With regard to rural sanitation, the ICR found that the GoT is still reliant on donor resources for sanitation interventions and that a significant effort is needed to improve sanitation coverage in rural areas.

[19] Petri, Naylor, Haque. 2014. "Environmental Enteropathy and Malnutrition: Do We Know Enough to Intervene?" *BMC Medicine*.
[20] Goodarz, Danaei. 2016. "Risk Factors for Childhood Stunting in 137 Developing Countries." http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002164 . Recent trials in Kenya and elsewhere suggest that household sanitation upgrades from unimproved to improved latrines, and handwashing stations do not reduce childhood diarrhea or improve growth (Null, Clair. 2018. *Lancet Glob Health* 6: e316–29).
[21] *Note:* This figure is derived from MoWI's methodology of estimating access and is not consistent with the findings of recent surveys such as DHS 2016.
[22] The NWIF is an agency under the MoWI which was established though the Water and Sanitation Act No. 12/2009. The NWIF has the mandate to provide investment support for rural water service provision in areas of mainland Tanzania, which are without adequate water services. The structure of the NWIF consists of a Board of Trustees, which includes a chairman and four members from the MoWI, Ministry of Finance and Planning (MoFP), and President's Office - Regional Administration and Local Government (PO-RALG). The NWIF is funded by fuel levies.
[23] World Bank. 2016. "Implementation Completion Report for the Water Sector Support Project, ICR3737."

Several critical challenges need to be addressed to ensure that the responsible institutions can increase and sustain water and sanitation service delivery. In 2017, the World Bank conducted a comprehensive Water, Sanitation and Hygiene (WASH) Poverty Diagnostic in Tanzania[24] using the vast sector data and research available. The main findings were as follows:

- **Access and failure rate.** Sustainable Development Goal (SDG) 6 calls for universal access to water and basic sanitation by 2030, a formidable challenge for Tanzania where rural access to improved water supply was at 48 percent in 2015, below the Sub-Saharan African average of 56 percent.[25] In 2016, 40 percent of water points were reportedly nonfunctional and 19 percent reportedly fail during the first year of operation.[26] The poor are disproportionally affected with a high correlation between poverty and lack of access to basic water supply. An in-depth analysis of water point data has shown that technology choice, hydrology, management, and location-based factors are to varying degrees responsible for the failures. The capacity of local institutions has persistently been ranked as the overarching challenge.
- **Skewed institutional incentives.** The high failure rate of rural water points is also attributed to an excessive focus on new construction. Local governments allocate nearly all their financial and human resources to the construction of new water points, disregarding the essential tasks of monitoring, building capacity, and providing technical backstopping to villages with existing water points. The limited management capacity of small, rural, and often marginalized communities led to frequent water system breakdowns.
- **Sanitation remains underfunded.** The sanitation sector achieved gains in coverage in recent years but still has a long road ahead. Though almost all Tanzanians practice fixed-point defecation, over 80 percent of rural Tanzanians rely on rudimentary, unimproved sanitation facilities. WASH promotion in schools and hospitals has received limited attention, and 75 percent of schools lack a functional handwashing facility with available soap and water. Over half of health facilities report routine water shortages, which can interfere with hygienic care.

Rural water supply. The sector has benefitted from extensive assessments, surveys, and research. Five important lessons on rural water supply emerged from WSDP-1:[27] (a) limited attention and resources were devoted to arrangements for water scheme maintenance, repair, and replacement; (b) the establishment of COWSOs was overlooked and only about 20 percent of villages have a registered COWSO, of which a majority suffer from acute capacity gaps in tariff setting and financial and operational management; (c) there were widespread shortcomings in value-for-money water supply service delivery, lack of quality assurance for design and construction, and poor standardization of designs and components; (d) unreliable data on scheme functionality and sustainability hampered efforts to address the growing backlog of nonfunctional schemes; and (e) national-level Ministry of Water and Irrigation (MoWI) staff in the water sector currently lack the resources and tools to provide the necessary leadership, support, and training to the regional- and district-level staff to develop their capacity on the technical and management aspects of water supply.

[24] World Bank. 2017. "Tanzania WASH Poverty Diagnostic."
[25] World Development Indicators, 2015.
[26] World Bank. 2017. "Tanzania WASH Poverty Diagnostic."
[27] World Bank. 2016. "Implementation Completion Report for the Water Sector Support Project, ICR3737."

Water quality of rural water supply often fails to meet national standards and 57 percent of rural households have drinking water contaminated with *E. coli* bacteria. Of these cases, 56 percent was due to contaminated water points and 44 percent was due to poor hygiene in households.[28] With technical assistance from the World Bank's Water and Sanitation Program (WSP), WSDP-1 made some progress in addressing water quality issues by introducing regional laboratories for water testing and implementing source protection and watershed management activities. However, these remedies are still to be fully operationalize and water treatment is uncommon in rural areas because it was neither introduced nor institutionalized.

Rural sanitation. Only 11 percent of rural Tanzanians presently have access to an improved latrine and of the 89 percent who do not, the overwhelming majority use a fixed point unimproved facility while 14 percent defecate in the open. Access to sanitation in schools is poor. In nearly two-thirds of the districts across the country, only 50 percent of public schools in rural areas have the required number of drop holes and only 43 percent have functional handwashing stations. Poor access to sanitation was exacerbated by a cholera outbreak in 2015 where a total of 30,121 cholera cases and 466 deaths (equivalent to a case fatality rate of 1.5 percent) were reported. The multifaceted nature of the sanitation challenge in rural Tanzania requires an integrated approach that addresses sanitation and hygiene across communities, a prerequisite to reduced stunting and improved health.

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

[28] Ministry of Water. 2015. "Water Quality Report in 30 LGAs." (473 water samples were collected and tested).

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. The groundwater risk is relatively low in Tanzania and the groundwater depletion risk comes mainly from irrigation, not water supply (drinking). This development is also mainly fueled by the population growth.

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.

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.

Annex 2: 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 particular 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 with made with public authorities, private sector and civil society actors.

With an initial tranche of US$100 million, the Clean Cooking Fund expects to support 8–12 country programmes within the first two years of operation. The experience, technological solutions, and business models can then be further replicated, adopted, and scaled up in other countries, which will accelerate progress toward universal access to clean cooking by 2030. An initial pipeline of IDA projects is ready to utilize the CCF once it is operationalized. Projects in Rwanda (already approved), Burundi, Ghana, Uganda, and Mozambique have been identified, at a total sector investment of about US$50–100 million. So far, the Netherlands, Norway and Denmark have made pledges to the Clean Cooking Fund.

Water

The key stakeholders include:

- RUWASA, lead agency (Representation at the National, Regional and District levels)
- The Ministry of Water
- PPP Note under the Ministry of Planning and Finance
- Water and gender specific Tanzanian NGOs
- The World Bank and IFC

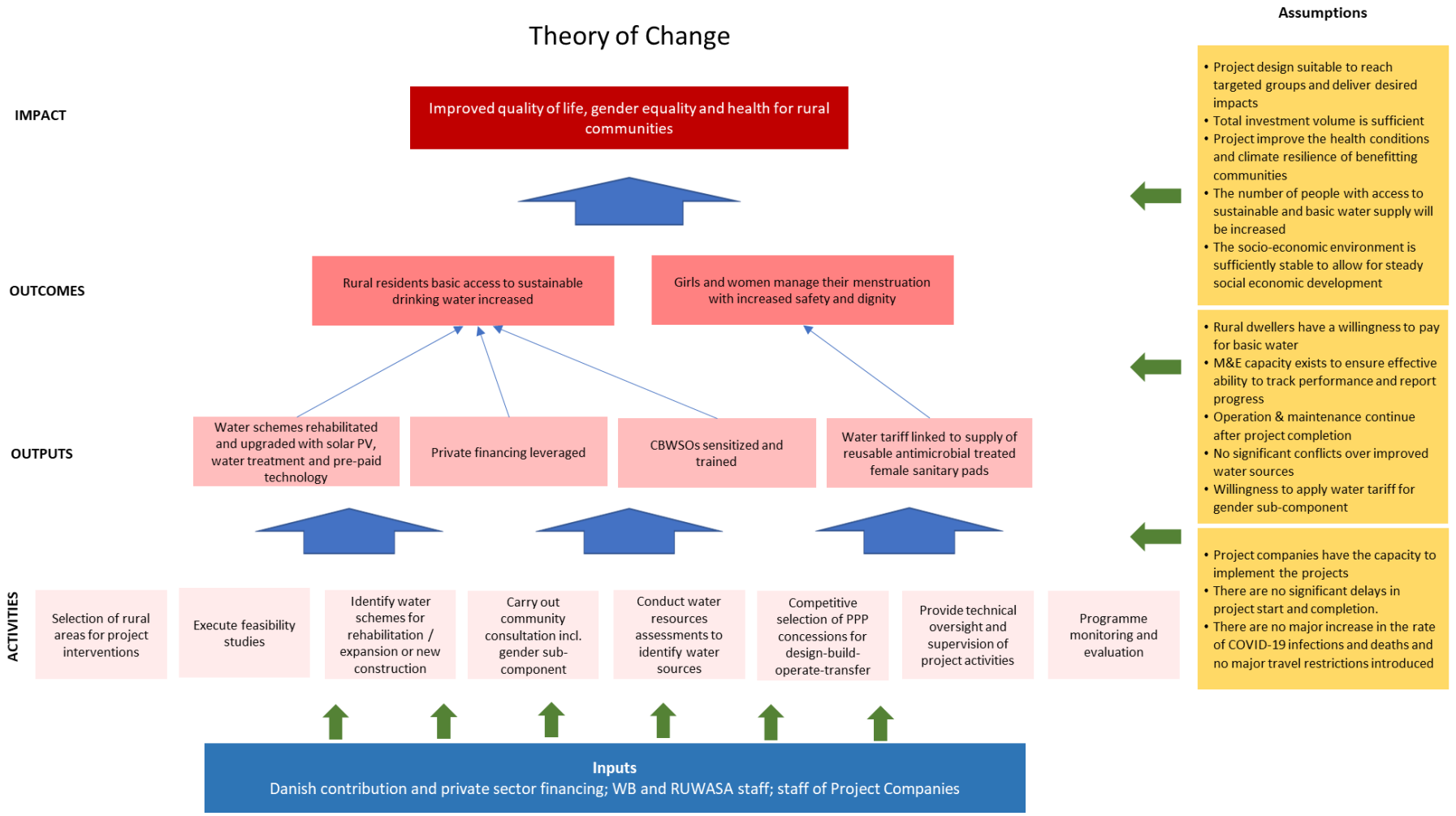
- Private sector:
    - Solar water pump suppliers and distributers
    - Pre-paid meters suppliers and distributers
    - Female hygienic pads suppliers and distributers
    - Investors
- Community Based Water Supply Organizations
- Local politicians and representatives
- Water customers

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 collect water tariffs; (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.

3.1. Water: Theory of Change and Results framework



1. What is the **political, economic, societal and institutional context**?

With steady, economic growth averaging 6.5 percent per annum, Tanzania has been one of the stronger performers in Sub-Saharan Africa (SSA) over the last decade. The COVID-19 pandemic, however, has had significant negative impacts on Tanzania's growing economy. Over 80 percent of the poor and extremely poor live in rural areas and rely on agriculture for their livelihood. The economy is highly dependent on natural resources, including water, and the rural water supply sector has benefitted from extensive assessments, surveys, and research. The two overarching lesson on rural water supply are the limited attention and resources allocated to arrangements for water scheme maintenance, repair, and replacement, and the enormous financing gap for the sector. For more information, see Section 2.1 and Annex 1 (context analysis).

2. What is **development problem or issue - and the desired transformation?**

Tanzania is officially water stressed, with likely effects on energy production, agriculture, and the livelihoods of the poorest. In 2017, rural access to basic water supply and sanitation was 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. 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 desired transformation is to significantly increase the engagement of the private sector in water supply services and thereby contribute to the achievement of the SDG6 for Tanzania. By improving the financial sustainability of rural water schemes, Public Private Partnerships can be leveraged to provide private sector financing for core investments in rural water supply infrastructure. This may result in transformational changes that are expected to contribute to gender equality, improved quality of life and health outcomes for rural communities.

3. **Which are the main changes** that will need to take place for this transformation to happen?

The main changes, which is already occurring in the country, is the Government of Tanzania's willingness to participate in a PPP-like scheme and a growing acceptance of rural communities towards private companies providing water supply services. In addition, the financial sustainability of the water systems is critical to ensure that private companies can increasingly invest in rural water supply infrastructure and operations and maintenance. The private companies can make profitable investments in in the sector as long as the revenue from water sales can be securely and efficiently collected.

4. **Who** – or which developments or factors - **are the most important drivers** of these changes?

Drivers of these changes include: i) increased, secure and remote revenue collection through pre-paid meters and mobile money; ii) more sustainable and 24/7 access to water. COVID-19 is also a driver for this change and the 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.

5. **How and with which modalities and instruments will we contribute** to the changes?

The vast majority of the Danish grant will be used to leverage private sector financing for rural water supply in Tanzania. The project will build directly on the current World Bank Tanzania Accelerating Solar Water Pumping via Innovative Financing Project but increase the responsibility and risk taken by the private sector

including to move from the current 40 percent private sector financing to above 60 percent. As such, the project will be one of the first attempts to leverage private sector financing at scale in Tanzania's rural water sector.

6. **Why do we think that the changes will happen**?

Tanzania was selected for this project due to the ongoing pilot projects where the private sector financing approach has been gradually introduced and linked to the World Bank's Tanzania: Sustainable Rural Water Supply and Sanitation Program, which provides a considerable monetary incentive for the Ministry of Water and RUWASA to increase private sector involvement. In addition, the price of water and willingness to pay are key determining factor for the project's viability and in Tanzania these are slightly higher than in neighboring countries. Lessons learned from the ongoing World Bank Tanzania Accelerating Solar Water Pumping via Innovative Financing Project include the following: i) Rural communities in Tanzania are open to private sector led approaches; ii) There is a preference for solar-powered pumps, or hybrids (PV and Grid) when compared to diesel; iii) A blended financing mechanisms for rural water supply is feasible and accepted by both communities and government players when sensitized through comprehensive and broad stakeholder consultations; and iv) The community-based water supply organizations and water users prefer pre-paid mobile money enabled water meters, which significantly increases revenue collection and reduces village-level rent seeking behaviour.

7. **Which are the main assumptions** that will need to hold true for the changes to happen?

The overarching assumption is that rural dwellers have a willingness to pay for safe water. Without a revenue stream from the sale of water, the PPP financing model will be unfeasible as it is this revenue that enables private sector financing. Based on surveys and data collected across thousands of rural villages in Tanzania TZ50 (USD 0.02) per 20 liter is a widely acceptable rate. The project will use the current community water tariffs thus not raising tariffs. 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.

8. **Which are the main risk factors** that may prevent the changes from taking place, or delay them, reduce their significance, etc.?

The main risk to the project is the Government's willingness to participate in a PPP-like scheme. As mentioned in section 5.1, there are several risk associated with the PPP approach, namely: i) Political and regulatory risks; ii) currency risk; and iii) payment risks: Other broader risks include: i) change of political support for PPP transactions; ii) conflict over water sources; and iii) underperformance of the private sector. See also Annex 5: Risk Management Matrix.

Results Framework

Project	Leveraging private sector financing for rural water supply in Tanzania
Project Objective	The project objective is contribute to the overall improvement of quality of life, gender equality and health of communities through increased and more sustainable access to rural water supply for households, health clinics and schools.
Impact Indicator	Number of people with basic and sustainable access to rural water supply

Outcome 1		Investments in water infrastructure	
Outcome indicator		Rural residents basic access to sustainable drinking water increased	
Baseline	Year	2021	0 (Communities have access to water but not available when needed and with significant price variation in the dry season)
Target	Year	2025	700,000 people of which 50% is female with access to basic drinking water service (JMP criteria).
Output 1.1		Water schemes[29] rehabilitated and upgraded with solar and pre-paid technology	
Output indicator		206 water schemes in selected villages rehabilitated and upgraded	
Baseline	Year	2021	0
Target	Year	2023	150
Target	Year	2025	206
Output 1.2		Private financing leveraged	
Output indicator		7,416,000 USD in private financing leveraged through the Danish grant by subsidizing the PPP	
Baseline	Year	2021	0
Target	Year	2023	5,400,000 USD
Target	Year	2025	7,416,000 USD
Output 1.3		Community-Based Water Supply Organizations (CBWSOs) sensitized and trained	
Output indicator		206 CBWSOs sensitized and trained by RUWASA	
Baseline	Year	2021	0
Target	Year	2023	150
Target	Year	2025	206
Output 1.4		Process outputs	
Output indicator		PPP tender issued for bidding by RUWASA	
Target	Year	2021	Concept note completed
Target	Year	2022	Final prefeasibility study completed
Target	Year	2022	Supplementary studies completed
Target	Year	2022	Feasibility study completed
Target	Year	2023	PPP tender issued for bidding by RUWASA

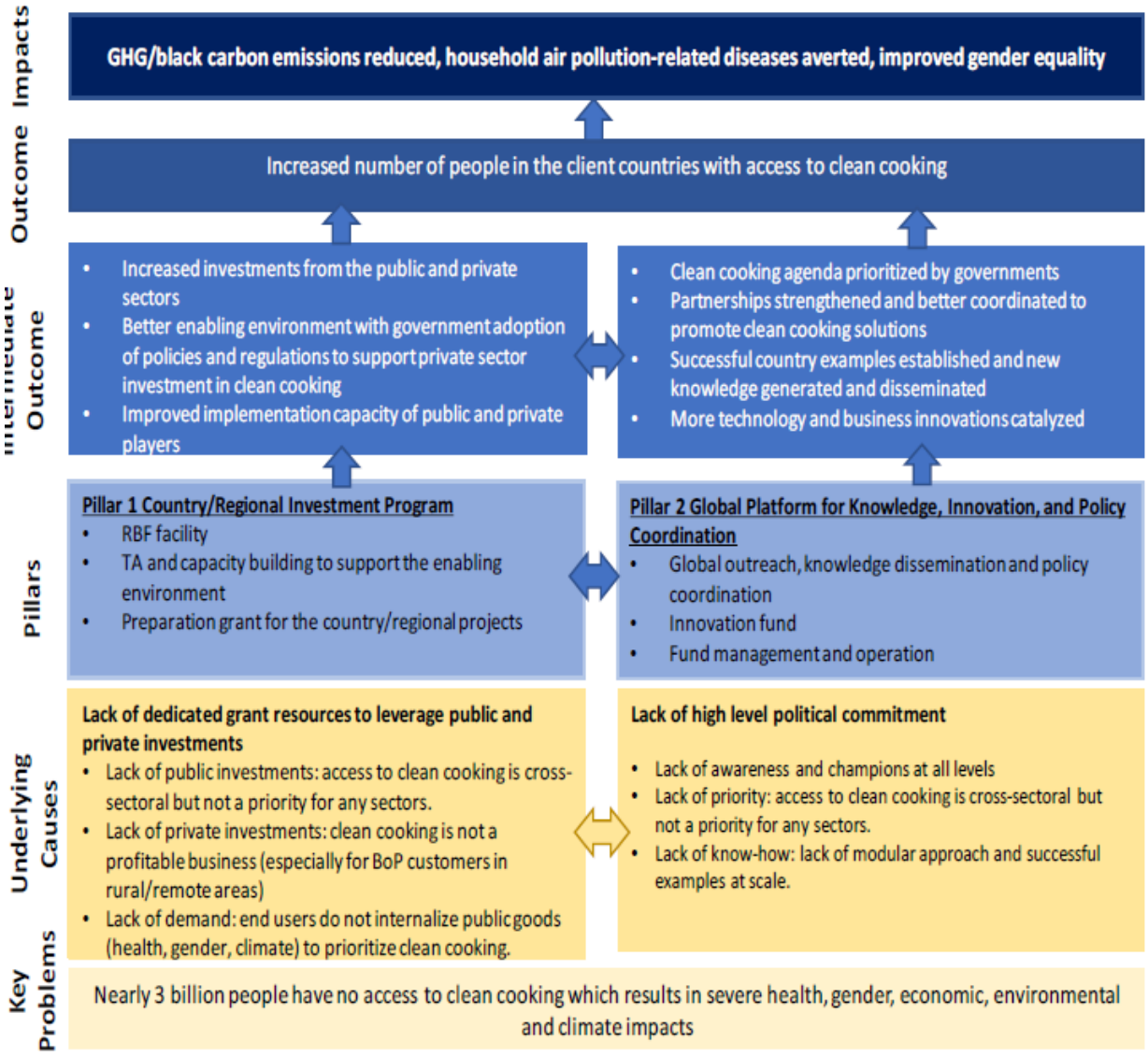
Outcome 2		Gender sub-component on menstrual health and hygiene	
Outcome indicator		25,000 girls and women in selected villages manage their menstruation with increased safety and dignity	
Baseline	Year	2021	Safe female sanitary pads are unaffordable to a large majority of the female rural population, especially the female student population.
Target	Year	2025	25,000 girls and women

[29] A water supply scheme is a system for the collection, transmission, treatment, storage and distribution of water from source to consumers.

Output 2.1		Villages with the water tariff linked to supply of reusable antimicrobial treated female sanitary pads	
Output indicator		50 villages of the 206 selected for water schemes rehabilitation/upgrading have the water tariff linked to supply of reusable antimicrobial treated female sanitary pads	
Baseline	Year	2021	0 villages
Target	Year	2023	25 villages
Target	Year	2025	50 villages

3.2. Clean Cooking Fund: Theory of Change and Results framework

Theory of Change



Assumptions:

- Market-based and investments-driven transformative solutions are needed to make a paradigm shift toward universal access to clean cooking by 2030
- Clean cooking must be a political, economic, and environmental priority, supported by high-level decision-makers, policies, investments, and multi-sector partnerships.
- Financial incentives and subsidies is needed. Results-Based Financing can incentivize the market and can be designed to fit the country context and market conditions.
- Achieving the challenge of universal access to clean cooking by 2030 will require two interlinked, enabling conditions: (i) high-level political commitment and (ii) dedicated grant resources to leverage public- and private-sector investments.

Results Framework for ESMAP's Clean Cooking Component

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

Example of Results Framework for clean cooking sub-component - Rwanda

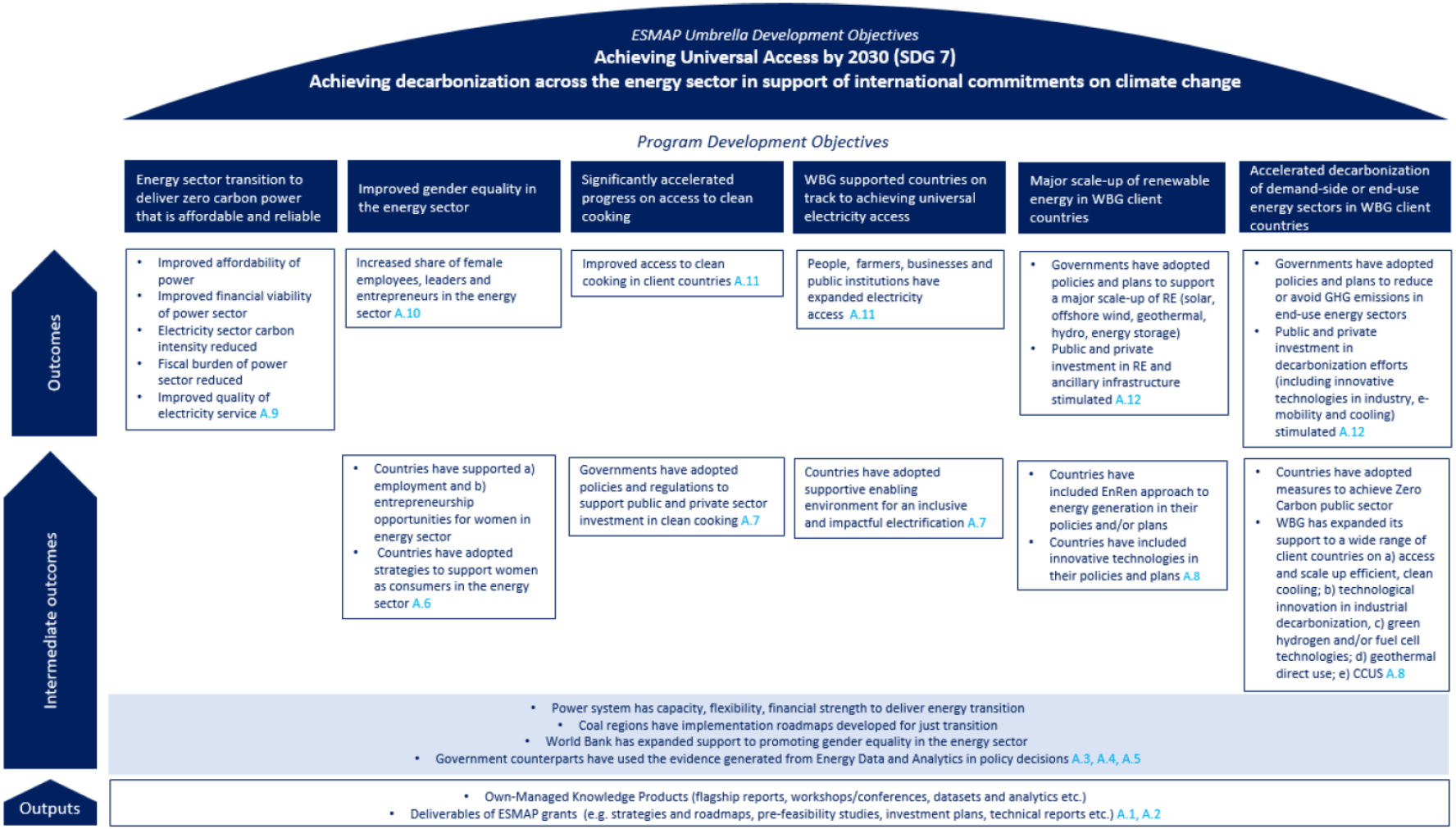
Project cooking intervention objective: Accelerated progress on access to clean cooking in Rwanda		
OUTCOME: Improved access to clean cooking in Rwanda		**Project target**
Outcome indicator 1.1	People provided with new or improved access to clean cooking solutions (Number).	2.15 million (500,000 households)
Outcome indicator 1.2	Amount of private investment mobilized (Amount(USD)).	US$19 million[64]
INTERMEDIATE OUTCOME: Governments have adopted policies and regulations to support public and private sector investment in clean cooking		
Intermediate outcome indicator 1.1	Policies and regulations adopted by the government to support clean cooking market development (Number).	1
Intermediate outcome indicator 1.2	Share of female workers in enterprises financed by Component 3 (Percentage).	10
OUTPUTS		
Output 1	Policies and regulations adopted by the government to support clean cooking market development (Number).	1

Example of Clean Cooking Component – Uganda (draft)

OUTCOME: Improved access to clean cooking in Uganda		
Outcome indicator 1	Number of people who gained access to clean cooking resulting from the CCF co-financed project	1.66 million people (or ~353,000 households)
Outcome indicator 2	Amount of investments mobilized (including both public and private financing)	US$30 million (IDA US$10m, CCF US$10m, and private sector US$10m)
INTERMEDIATE OUTCOME: Governments have adopted policies and regulations to support public and private sector investment in clean cooking		
Intermediate outcome indicator 1	Number of policies and regulations adopted by the governments to support clean cooking market development	1 (Adoption of standards related to clean cooking technologies)
Intermediate outcome indicator 2	Proactive actions to promote female employment/entrepreneurship and gender co-benefits (number).	5 (TA on female entrepreneurship mentorship, innovation grant for female entrepreneurs, TA on product design to incorporate women needs, awareness raising targeting women groups, and gender co-benefits measurements)
OUTPUTS:		
Output 1	Strategies, policies, regulations to support clean cooking (number)	2 (TA on policies/regulations review and TA on standards and testing)
Output 2	Innovative technology, business, and financing approaches, incorporating both women's and men's preferences and needs (number)	2 (innovations on local product design, consumer financing/PAYGo, or business bundling)

3.2. Green energy transition and Job creation

ESMAP's Theory of Change for 2021-2024



Annex 4: Risk Management Matrix

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

Risk	Risk mitigation and management
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.	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.
COORDINATION: A large number of country projects and stakeholders impede effective coordination and collaboration.	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.
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.	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.
CONTEXT: The political economy of fragility, conflict, and violence (FCV)	Specific approaches suitable to various FCV contexts will be adopted, including greater reliance on and collaboration with the local private sector, nonprofit

countries is blocking progress on access to clean cooking.	partners, and UN agencies. The RBF Facility will provide additional incentives for delivering clean cooking solutions in FCV areas.
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.	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.
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.

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 skeptism to increase private sector involvement	Moderate	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. In addition, an ongoing exercise conducted by RUWASA has indicated a significant community demand for private sector participation.
Possible upsurge in COVID-19 cases that could make working in rural areas of Tanzania difficult	Moderate	High	Introducing COVID-19 control measures for all workers connected with project implementation	Residual risk remains but mitigation measures could reduce risk of infections amongst project workers.	The world is under the COVID-19 epidemic, and vaccines have only just been developed. Most African countries were in the process of re-opening after lockdowns in the second and third quarters of 2020.
Conflict over water sources	Likely	Minor	The program will significantly increase dry season water availability which should reduce risk	Residual risk reduced.	Conflicts among different pastoral communities are not uncommon in East Africa. However, the Tanzanian police is increasingly being used to

			of conflicts. More importantly, the risk of conflict is carefully assessed prior to construction and often well-known by the local authorities.		mediate and protect communities in conflict hotspot areas. Generally, this risk will be mitigated by community engagement with broad representation from local stakeholders including politicians.

Programmatic risks

Risk Factor	Likelihood	Impact	Risk response	Residual risk	Background to assessment
Underperfor-mance by the private sector	Likely	Major	A performance bond and other sanctions in the PPP concession agreement will incentives 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.
Damage to groundwater sources	Unlikely	Significant	Borehole yields (production volume) are to be examine carefully including test pumping and each borehole will be equipped with a remote water level sensor to enable live monitoring of groundwater levels	Residual risk reduced.	This has mainly been reported in Asia (India and Pakistan) and normally associated with over-pumping linked to irrigation. Since this project will focus on water supply (drinking water) in Tanzania, the general risk should be low. However, saline intrusion does pose a risk in coastal areas, especially in Dar es Salaam and on Zanzibar. The project will not be implemented there.
The need for swift implementation leads to short cuts on community involvement, hygiene promotion and following operation and maintenance	Moderate	High	Ensure that national policies are followed on community aspects and operation and maintenance and cost recovery systems. This will be ensured through providing specific responsibilities on this to the private sector.	Residual risk remains but mitigation measures could reduce risk	Operation and maintenance is well-covered and ensured through the PPP approach where the private investor has a financial interest in a continual operation. Historically, the insurance of adequate and timely community involvement has been a challenge.

Institutional risks

Risk Factor	Likelihood	Impact	Risk response	Residual risk	Background to assessment
Damage to Danida and World Bank's reputation from failure to successfully complete projects	Low	High	PPP Act followed.	Residual risk remains	Over the last decades, The World Bank has faced reputational damage from engagement in high profile PPPs. However, this PPP will be implemented strictly following the official procedures of the relatively new PPP Act which ensures approval from all relevant government entities including the Ministry of Finance and Planning.
Financial loss and risk of institutional liability for loss/failure from corruption/financial mismanagement	Low	High	The Bank's involvement will reduce this risk although it cannot be fully mitigated.	Residual risk remains	Tanzania ranked 94 out of 179 in the Corruption Perceptions Index (CPI) published annually by Transparency International.

Annex 5: Budget Details

Overall budget	DKK (million)	USD (million)
Engagement 1: Access to water in Tanzania	**41.00**	**6.53**
Component 1.1: Investment in water infrastructure	31.00	4.94
Component 1.2: Feasibility Study, Extensive Community Consultation and Gender	8.00	1.27
Contingencies (5%)	2.0	0.32
Engagement 2: Access to clean cooking	**41.00**	**6.53**
Output 2.1: Clean cooking country investments in Africa	37.00	5.89
Output 2.2: Global knowledge and innovation	4.00	0.64
Engagement 3: Job creation and renewable energy	**4.55**	**0.72**
Programme management	**8.45**	**1.34**
Project supervision and support (4%)	3.70	0.58
Management fee (5%)*	4.75	0.76
TOTAL	**95.00**	**15.14**

USD exchange rate (September 2, 2021): 6.2759

**Fixed percentage applied to recipient-executed grants*

Disbursement schedule (DKK million)

Engagement	2021	2022	2023	2024	Total
Access to water	6	15	15	5	41
Access to clean cooking	10.25	10.25	10.25	10.25	41
Job creation and energy transition	4.55	0	0	0	4.55
Programme management	2.50	2.50	2.50	0.95	8.45
Total	**23.30**	**27.75**	**27.75**	**16.20**	**95**

Annex 6: List of supplementary materials

Clean Cooking

- SDG7 tracking report 2020
- Concept Note of the Clean Cooking Fund
- ESMAP Results Framework 2021-2024
- ESMAP Business Plan 2021-2021
- What Drives the Transition to Clean Energy cooking services
- Regularity Indicators for Sustainable Energy - RISE (esmap.org)
- State of Access to Modern Energy Solutions for Cooking Services - The State of Access to Modern Energy Cooking Services (worldbank.org)
- Rwanda Energy Access and Quality Improvement Project (example of clean cooking component supported by the Clean Cooking Fund) - http://documents1.worldbank.org/curated/en/819241600653622828/pdf/Rwanda-Energy-Access-and-Quality-Improvement-Project.pdf
- Uganda Electricity Access Scale-up project (confidential and currently being negotiated)

Water

- Project-PPP Draft pre-feasibility study for pre-paid water meters, Client –World Bank and RUWASA, Tanzania (February 18, 2021)
- Project Commitment Paper: Accelerating Solar Water Pumping via Innovative Financing (P161757). The Global Partnership on Output-based Aid (October 19, 2018) UPL: https://projects.worldbank.org/en/projects-operations/project-detail/P161757
- World Bank. 2016. "Implementation Completion Report for the Water Sector Support Project, ICR 3737."
- Video: https://www.worldbank.org/en/news/video/2020/01/15/financing-sustainability-the-future-of-rural-water-systems
- Blog: https://blogs.worldbank.org/water/closing-gaps-and-financing-taps-next-step-rural-water-supply
- World Bank. 2018: Solar Pumping: The Basics: UPL: http://documents.worldbank.org/curated/en/880931517231654485/Solar-pumping-the-basics
- Guidance on Menstrual Health and Hygiene: https://www.unicef.org/wash/files/UNICEF-Guidance-menstrual-health-hygiene-2019.pdf
- WSSCC review of MHH progress and challenges in Tanzania, Kenya and India. Tanzania Country Report (December 2020).

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. Preparation of regular ESMAP webinars on Clean Cooking and participation in other international events on clean cooking
6. Contributions to international publications such as SDG7 Tracking Report and the Regularity Indicators for Sustainable Energy (RISE) and
7. Publishing technical notes on lessons-learned on clean cooking in selected countries.
8. Video: 3-minutes.
9. ESMAP public seminars and trainigs
10. Flagships reports and country case stories
11. Engagement of Denmark and ESMAP in relevant events

Annex 8: Process Action Plan

Action/product	Deadlines
Project identification for Finance Bill 2021	April 2020
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	4 May
Appraisal	4 May – 8 August
Incorporate recommendations from appraisal into programme documentation	8 Aug. - 6 Sep.
Confirm agenda item on Council for dev. Policy	19 August
GDK Management review and approval	6-10 September
Submit programme documentation including annexes to Council for Development Policy	13 September
Council for Development Policy meeting	30 September
Approval of the programme by the minister	Early October
Prepare “aktstykke”	7 October
Meeting in the Finance Committee	11 November
Signing of agreement	15 November
First disbursement	1 December

Annex 9: Summary of Appraisal Recommendations

Title of Programme/Project	Danish support to clean cooking and access to water in Africa through ESMAP
File number/F2 reference	2021-10293
Appraisal report date	01-08-2020
Council for Development Policy meeting date	14-10-2021

Summary of possible recommendations not followed

Recommendation 3 (*subcomponent on menstrual hygiene is re-considered)* and recommendation 4 (*the allocation for Engagement 1 on water in Tanzania should be provided under a special associated trust fund)* have not be followed for reasons specified below. Furthermore, recommendation 8 (*Funds for the Tanzania project should only be released based on progress in delivery on the results framework. The AT recommends that the first tranche should only be the 6 mill, budgeted for the feasibility study)* has only been followed partially i.e. disbursement will, as part of normal MFA financial management procedures, only take place according to expected spending the coming year but the first tranche has been reduced to DKK 6 million. Likewise, recommendation 12 (*Rather than having specific annual disbursements as indicated in the cover note, the AT recommends to apply normal procedures for release of funds to ESMAP based on unspent funds from previous disbursement and a realistic assessment of projects in pipeline for funding the coming year)* has only been followed partially i.e. a disbursement scheduled has been maintained, MFA will on an annual basis review the need to adjust this schedule.

Overall conclusion of the appraisal

The overall conclusion of the appraisal is that the proposed contributions to ESMAP are highly relevant and in line with Danish strategic priorities. In line with the principles of Doing Development Differently the budget is based on objectives and more detailed activities will be developed according to World bank procedures.

The AT can recommend the document for approval on the condition that the recommendations below are reflected in the final project document.

Project level

Recommendation 1: The project document(s) should include a section, which more clearly describes the management structure (role of Consultative Group, Technical Advisory Group and World Bank Board) and procedures for approval of projects and activities under ESMAP in general and for CCF and the Tanzania project in particular.	A section describing the ESMAP's management and governance structure has been added in section 2.2. A description of procedures of approval of projects has also been added.

Recommendation 2: Restructure the project document into two separate grants or alternatively one grant with two clearly separated engagement documents held together by a common introduction.	The programme document has been restructured with two separated engagements but with a common introduction. In addition, a complementary support for job creation in the energy transition has been added.
Component 1: Access to water in Tanzania	
Recommendation 3: The AT finds that the subcomponent on menstrual hygiene will be difficult to implement through RUWASA and may divert scarce human resources away from the main objective. The AT strongly recommends that the inclusion of this activity is reconsidered.	The ongoing $350 million World Bank project already has a small MHM sub-component with RUWASA. The proposed activity will only involve one tender/procurement to be executed by RUWASA and is considered to be a relevant and efficient way of completing targeted gender-activities to complement broader gender mainstreaming of the project. The design and implementation of this sub-component will based on the result of the feasibility studies and the involvement of RUWASA.
Recommendation 4: The allocation for Engagement 1 on water in Tanzania, which does not form part of the ESMAP Business plan, should be provided under a special associated trust fund to secure specific reporting and ensure ring-fencing of the investment in water, which is intended to deliver directly to the ambitious Danish political goals on access to water in Africa.	The solar water pumping component of this project fall under ESMAP's Trust Fund 2.0 reform. The Umbrella 2.0 allows to either preference the Danish support to Engagement 1 in Tanzania or establish an associated trust fund. Denmark and most other donors have a long trusted partnership with ESMAP of preferencing. The formulation team do not see a need to establish an associated trust fund, which would make the set-up of the Danish support more complex (further details on the Umbrella TF set-up is found here TFReformTransitionGuide.pdf (worldbank.org). It is correct that solar-water pumping is not an integrated part of ESMAP's results framework for core activities. However, the annual reporting produced for Denmark will follow same procedures for both preferencing and an associated trust fund. The Tanzania country team will submit the information to ESMAP where the Monitoring and Evaluation team will validate the information, include it in ESMAP's annual report and submit a progress report to Denmark. It is also noted

	that ESMAP supported the World Bank's initial efforts on solar water pumping in Tanzania (2015). Specific reporting requirements for the engagement including annual progress reports will be specified and confirmed in the confirmation letter from ESMAP upon signing the amendment to the existing administrative agreement with Denmark. Ring-fencing with specific reporting requires may not align well with current efforts related to efficiency, value for money and a lean approach to program formulation and implementation.
Recommendation 5: RUWASA will need considerable technical assistance for management and implementation of the activities. Unless technical assistance is provided through other channels, the project budget should include funding for Technical Assistance to RUWASA.	An important and integral part of the programme is to support RUWASA in the preparation and execution of Public-Private-Partnerships. The amount for implementation support to RUWASA has been doubled under the project budget based on this recommendation. Activities under the programme component 2 will provide technical assistance to RUWASA and the ongoing World Bank Water Sector Development Program (WSDP) for the period 2006-2025 contains significant technical support to RUWASA. Furthermore, The World Bank's GWSP (supported by Denmark) will continue to support innovative endeavours in the water sector, such as this.
Recommendation 6: A narrative ToC providing the necessary chain of activities/events to reach the outcomes should be included in the Project Document.	The narrative ToC has be revised to include a more detailed description of the necessary chain of activities to reach the outcomes.
Recommendation 7: The current results framework should be supplemented with process indicators to enable monitoring of progress towards a final project document. Furthermore a revised and more detailed results framework should be developed based on the final project document and included in the Danida results reporting system.	The results framework has been revised to include process indicators. Once the final project document has been appraised and approved by the World Bank the results framework will be revisited and potential changes made. Key indicators will included in the Danida results reporting system.
Recommendation 8: Funds for the Tanzania project should only be released based on progress in delivery on the results framework. The AT recommends that the first tranche should only be the 6 mill, budgeted for the	The first disbursement to the project planned for late 2021 will be reduced to DKK 6m to cover only the costs of the feasibility study. The disbursement schedule is based on the expected project cost and disbursement will

feasibility study. Further transfers should only take place based on a final project document approved through the World Bank system.	as part of normal MFA financial management procedures only take place according to expected spending the coming year.
Component 2: Access to clean cooking	
Recommendation 9: The AT recommends that the new commitment to CCF should be provided as a an addition to the already existing core contribution grant to ESMAP 2021-25 (making it a total of 61 mill DKK as preferenced funding for CCF) without further earmarking. In this way, the results can be reported based on the annual report from CCF/ESMAP as Denmark's relative contribution to the total budget of the CCF.	The Formulation Team can confirm that the additional Danish contribution to CCF will complement the previous Danish contribution from 2020. Only Danish preference is a geographic preference to Africa. Reporting will follow same format (ESMAP results framework and annual report).
Recommendation 10: The project document should include a description of the procedures for release of funds to the recipient countries and a description of the flow of funds.	A description of approval and release funds has been included on page on page 22. CCF release of funds will follow similar procedures as IDA.
Recommendation 11: The issue of technology choice should be considered in the project document, and safeguards could be considered to avoid Danish financing of low-grade technologies (simple improved stoves) or technologies utilizing non-renewable resources (LPG and ethanol). Furthermore Denmark should pursue the issue in the Consultative Board when discussing new interventions.	Denmark will through its contribution to CCF support the Nordic-Baltic Constituency's (NBC) approach to energy investments in the World Bank Group. This includes the position on usage of LPG/gas where use of LPG/gas for clean cooking should only be considered in IDA countries based on existing gas infrastructure and/or when renewable energy alternatives are not feasible. Denmark will promote this position through our engagement in the CCF and ESMAP but cannot veto. Denmark supports the CCF position of supporting clean cooking solutions that meet Energy Tier 3 as minimum or at least two tiers above the established baseline; unless a strong case is made based on country-specific conditions. Text in main document has been updated.
Recommendation 12: Rather than having specific annual disbursements as indicated in the cover note, the AT recommends to apply normal procedures for release of funds to ESMAP based on unspent funds from previous	For administrative purposes, a planned disbursement schedule will be maintained. The CCF is multi-donor fund and implemented by the World Bank in collaboration with

disbursement and a realistic assessment of projects in pipeline for funding the coming year. These procedures should be described in the project document and in the funding agreement with CCF.	recipient countries. This requires a planned disbursement plan. However, Denmark will on an annual basis review the need to adjust the disbursement plan. This review will take place in May/June during the annual ESMAP GC meeting.
Recommendation 13: Remove contingencies from the budget for CCF. Contingencies are not relevant for a contribution to a basket fund, where concrete activities are only formulated at a later stage.	Contingencies have been removed from the CCF budget.
Recommendation 14: The schematic ToC in Annex 1 should be supplemented with a narrative in line with the AMG.	Assumption has been included in annex 3.

I hereby confirm that the above-mentioned issues have been addressed properly as part of the appraisal and that the appraisal team has provided the recommendations stated above.

Signed in Copenhagen…….. on the 5th of August 2021.……..……

Jan Wesarg Riemer

Appraisal Team leader/ELK representative

I hereby confirm that the responsible unit has undertaken the follow-up activities stated above. In cases where recommendations have not been accepted, reasons for this are given either in the table or in the notes enclosed.

Adam Sparre Spliid

Signed in…Copenhagen…….…….on the 10th of September 2021……

Deputy Head of Unit/Embassy