Meeting of the Board
21 – 24 October 2024
Songdo, Incheon, Republic of Korea
Provisional agenda item 10

GCF/B.40/02/Add.05

30 September 2024

Consideration of funding proposals – Addendum V

Funding proposal package for FP243

Summary

This addendum contains the following seven parts:

a) A funding proposal titled "Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia";
b) No-objection letter issued by the national designated authority(ies) or focal point(s);
c) Environmental and social report(s) disclosure;
d) Secretariat's assessment;
e) Independent Technical Advisory Panel's assessment;
f) Response from the accredited entity to the independent Technical Advisory Panel's assessment; and
g) Gender documentation.

Table of Content

Funding proposal submitted by the accredited entity 3

No-objection letter issued by the national designated authority(ies) or focal point(s) 125

Environmental and social report(s) disclosure 126

Secretariat's assessment 130

Independent Technical Advisory Panel's assessment 147

Response from the accredited entity to the independent Technical Advisory Panel's assessment 157

Gender documentation 159

Funding Proposal

Project/Programme title:	**Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia**
Country(ies):	**Ethiopia**
Accredited Entity:	Ministry of Finance (MOF)
Date of first submission:	*[YYYY/MM/DD]*
Date of current submission	*[2024/08/20]*
Version number	*V.14*

Contents

Section A **PROJECT / PROGRAMME SUMMARY**

Section B **PROJECT / PROGRAMME INFORMATION**

Section C **FINANCING INFORMATION**

Section D **EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA**

Section E **LOGICAL FRAMEWORK**

Section F **RISK ASSESSMENT AND MANAGEMENT**

Section G **GCF POLICIES AND STANDARDS**

Section H **ANNEXES**

Note to Accredited Entities on the use of the funding proposal template

- Accredited Entities should provide summary information in the proposal with cross-reference to annexes such as feasibility studies, gender action plan, term sheet, etc.
- Accredited Entities should ensure that annexes provided are consistent with the details provided in the funding proposal. Updates to the funding proposal and/or annexes must be reflected in all relevant documents.
- The total number of pages for the funding proposal (excluding annexes) **should not exceed 60**. Proposals exceeding the prescribed length will not be assessed within the usual service standard time.
- The recommended font is Arial, size 11.
- Under the GCF Information Disclosure Policy, project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Accredited Entities are asked to fill out information on disclosure in section G.4.

Please submit the completed proposal to:
fundingproposal@gcfund.org
Please use the following name convention for the file name:
"FP-[Accredited Entity Short Name]-[Country/Region]-[YYYY/MM/DD]"

ACRONYMS

Acronym	Definition
AE	Accredited Entity
CRGE	Climate Resilient Green Economy
EPC	Engineering Procurement and Construction
ESS	Environmental and Social Safeguards
FHHs	Female-Headed Households
GCF	Green Climate Fund
GHG	Greenhouse Gas
GoE	Government of Ethiopia
IUAs	Irrigation Users Associations
M&E	Monitoring and Evaluation
MOF	Ministry of Finance
MoIL	Ministry of Irrigation and Lowlands
MOWE	Ministry of Water and Energy
MRV	Monitoring, Reporting, and Verification
NDA	National Designated Authority
NDC	Nationally Determined Contributions
O&M	Operation and Maintenance
RUSACCOs	Rural Savings and Credit Cooperatives
SDG	Sustainable Development Goals
SWP	Solar Water Pumping
WOFED	Woreda Office of Finance
WUAs	Water Users Associations

PROJECT/PROGRAMME SUMMARY				
A.1. Project or programme	Project	**A.2. Public or private sector**	Public	
A.3. Request for Proposals (RFP)	*If the funding proposal is being submitted in response to a specific GCF Request for Proposals, indicate which RFP it is targeted for. Please note that there is a separate template for the Simplified Approval Process and REDD+.* Not applicable			
A.4. Result area(s)	*Check the applicable GCF result area(s) that the overall proposed project/programme targets below. For each checked result area(s), indicate the estimated percentage of **GCF and Co-financers' contribution** devoted to it. The total of the percentages when summed should be 100% for GCF and Co-financers' contribution respectively.*			
			GCF Contribution	**Co-financers' contribution[1]**
	Mitigation total		**15.73 %**	**9.1 %**
	☒ Energy generation and access		15,73 %	9.1 %
	☐ Low-emission transport		NA	NA
	☐ Buildings, cities, industries and appliances		NA	NA
	☐ Forestry and land use		NA	NA
	Adaptation total		**84.26%**	**90.9 %**
	☒ Most vulnerable people and communities		42.14 %	45.45 %
	☒ Health and well-being, and food and water security		42.13 %	45.45 %
	☐ Infrastructure and built environment		NA	NA
	☐ Ecosystems and ecosystem services		NA	NA
A.5. Expected mitigation outcome *(Core indicator 1: GHG emissions reduced, avoided or removed / sequestered)*	173,220 tCO_2eq (Lifetime of assets 2024 – 2049) 24,250 tCO_2eq (Project period, 2024-2030)	**A.6. Expected adaptation outcome** *(Core indicator 2: direct and indirect beneficiaries reached)*	2.1 million beneficiaries	
			355,236 direct beneficiaries disaggregated as 174,065 and 181,171 male and female respectively have been targeted	A total of 1,757,752 indirect beneficiaries disaggregated as 878,876 male and 878,876 female respectively.
			0,3% of total population	1,8% of total population

[1] Co-financer's contribution means the financial resources required, whether Public Finance or Private Finance, in addition to the GCF contribution (i.e. GCF financial resources requested by the Accredited Entity) to implement the project or programme described in the funding proposal.

A.7. Total financing (GCF + co-finance[2])	49,982,775 USD	**A.9. Project size**	Small (Up to USD 50 million)
A.8. Total GCF funding requested	44,994,677 USD		

A.10. Financial instrument(s) requested for the GCF funding	*Mark all that apply and provide total amounts. The sum of all total amounts should be consistent with A.8.*		
	☒ Grant USD 44,994,677 ☐ Loan Enter number ☐ Guarantee Enter number	☐ Equity Enter number ☐ Results-based payment Enter number	
A.11. Implementation period	2024 – 2030 (7 years)	**A.12. Total lifespan**	2024 – 2049 (25 years)
A.13. Expected date of AE internal approval	*21/06/2024*	**A.14. ESS category**	*Refer to the AE's safeguard policy and GCF ESS Standards to assess your FP category.* B
A.15. Has this FP been submitted as a CN before?	Yes ☒ No ☐	**A.16. Has Readiness or PPF support been used to prepare this FP?**	Yes ☐ No ☒
A.17. Is this FP included in the entity work programme?	Yes ☒ No ☐	**A.18. Is this FP included in the country programme?**	Yes ☒ No ☐
A.19. Complementarity and coherence	*Does the project/programme complement other climate finance funding (e.g. GEF, AF, CIF, etc.)? If yes, please elaborate in section B.1.* Yes ☐ No ☒		
A.20. Executing Entity information	Ministry of Irrigation and Lowlands (MoIL), Ethiopia, Public institution Ministry of Water and Energy (MOWE), Ethiopia, Public institution Rural Savings and Credit Cooperatives (RUSACCOs)		

[2] Refer to the Policy of Co-financing of the GCF.

A.21. Executive summary

1. Ethiopia, highly vulnerable to the impacts of climate change, faces a series of climatic challenges including erratic rainfall, increasing temperatures, and prolonged droughts. The unpredictability of rainfall and the increasing frequency of droughts have severely compromised agricultural productivity, leading to food and water insecurity. The absence of reliable water sources further exacerbates these challenges, pushing vulnerable communities deeper into poverty and increasing their overall vulnerability.
2. Rural communities in **Amhara** predominantly depend on rain-fed subsistence agriculture for their livelihoods, which renders them highly vulnerable to climate impacts such as precipitation and temperature changes. Climate change has begun to accelerate drought cycles and increase overall climate variability. Regional[3] and global[4] climate models project an increasing occurrence of extreme weather events and rainfall variability in the project regions. Increasing droughts slow a country's gross domestic product (GDP) growth[5] and spur climate vulnerability of rural households, especially concerning the food-water nexus.[6] In Ethiopia only 5% of land is irrigated and crop yields from small farms are below regional averages. In **Oromia**, the livelihoods of pastoralists center on livestock which are similarly vulnerable to drought given that climate stresses and resulting water shortages have already resulted in a critical decline in quantity and quality of feed, reducing productivity and increasing mortality of animals. While climate change increasingly poses an existential risk for marginalized communities and is a key driver for people requiring humanitarian assistance, in particular women and children[7]effective responses also promise transformative economic potential through enhancing climate-resilient water access and agriculture.
3. The proposed project seeks to enhance climate resilience in the Kobo-Girana Valley in Amhara and the Borena Zone in Oromia by providing sustainable access to safe water through the deployment of Solar Water Pumping (SWP) systems. These systems will tap into groundwater resources, using solar energy to power the pumps, thereby offering a reliable source of water for irrigation, drinking, and livestock. By improving water access, the project aims to reduce reliance on inconsistent rainfall and increase agricultural productivity. The introduction of modern irrigation technologies will further enhance water use efficiency, supporting the transition from traditional farming methods to more resilient agricultural practices.
4. The Ministry of Finance (MOF), the Ministry of Irrigation and Lowlands (MOIL), the Ministry of Water and Energy (MOWE) in collaboration with the regional authorities will facilitate and provide financial and technical assistance for scaling up solar water pumping and sustainable agriculture, and provide enabling environment support.
5. . This initiative integrate sustainable water extraction practices in the design and management of systems. Coupled with efforts to build institutional capacity and improve policy frameworks, will create an enabling environment that supports the sustainable use of water resources. Additionally, the project will incorporate digital technologies, such as smart water meters and digital payment systems, to monitor and manage water usage effectively.
6. The project is expected to deliver significant climate mitigation and adaptation benefits. It aims to reduce greenhouse gas emissions by approximately 173,220 tCO2eq over the lifetime of the installed systems (2024–2049), with a reduction of 24,250 tCO2eq during the project implementation period (2024–2030). In terms of adaptation, the project will directly benefit approximately 355,236 individuals, including men and women, and indirectly support the resilience of 1.75 million people. These benefits will manifest through improved water security, enhanced agricultural productivity, and increased community resilience, particularly in the drought-prone areas of the project sites.
7. Beyond these primary objectives, the project will generate significant economic and social co-benefits. It will create job opportunities, stimulate local economies, and promote gender-sensitive initiatives by empowering women and marginalized groups. These efforts will ensure that all community members, particularly those most vulnerable, benefit from the project's interventions. These indirect benefits consist of better food security and employability in the two intervention regions, the attraction of additional funding from private or public sources for similar projects ("lighthouse effect"), as well as a lower potential of water-related conflicts given the preventative effects of providing equitable access to clean and safe water. The project also addresses potential risks, such as foreign currency shortages, limited technical expertise, and regional

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[3] Gebrechorkos, Solomon; Hülsmann, Stephan; Bernhofer, Christian (2019): Regional climate projections for impact assessment studies in East Africa, in: Environmental Research Letters, 14, p. 044031

[4] Intergovernmental Panel on Climate Change (IPCC) (2022): Climate Change 2022: Mitigation of Climate Change. Working Group III Contribution to the IPCC Sixth Assessment Report, IPCC

[5] EU Science for Environment Policy (2014): Droughts and floods slow economic growth, The University of the West of England, Bristol

[6] Hill, Ruth; Porter, Catherine (2017): Vulnerability to Drought and Food Price Shocks: Evidence from Ethiopia, in: World Development, 96, p. 65-77

[7] UNOCHA (2022): Situation Report, July 2022, https://reports.unocha.org/en/country/ethiopia/ (accessed July 28th, 2022)

conflicts, by including capacity-building programs and fostering community engagement to ensure long-term sustainability.

8. The project puts local communities at the center of the implementation approach, proposing a governance and implementation arrangement that is carried by local communities represented in legally established irrigation/water users associations. Ethiopia has a long history of community-led organization across sectors and has established IUAs in other water access schemes. Maintenance and operation of the assets is provided by specialized public or private service providers. By involving local communities, particularly women and marginalized groups, the project ensures that the interventions are inclusive and responsive to the specific needs and conditions of the targeted regions. This participatory approach not only fosters a sense of ownership among beneficiaries but also enhances the long-term sustainability of the project outcomes.
9. Moreover, the project incorporates innovative financing mechanisms through provision of returnable grants, to make modern agriculture inputs and irrigation services accessible to smallholder farmers. The revolving fund will be used for the purchase of farming equipment and other essentials to enhance productivity and for livestock. It will be also accessed by the Irrigation Service Providers (ISPs) who will be providing operational, maintenance and other services, which will be defined through formal agreements. GCF's financial support is critical in overcoming the high upfront costs associated with transitioning to solar-powered irrigation systems, which have been a major barrier to their adoption in Ethiopia.
10. The project also emphasizes the importance of monitoring and evaluation to ensure that the interventions are achieving their intended outcomes. The use of digital technologies, such as smart meters, will allow for precise monitoring of water usage and system performance. This data will be crucial for managing water resources sustainably, preventing over-extraction of groundwater, and ensuring that the benefits of the project are maximized and equitably distributed. Additionally, the project will establish a framework for regular reporting and assessment, allowing stakeholders to track progress and make necessary adjustments to strategies and operations.
11. This initiative aligns with Ethiopia's broader Climate Resilient Green Economy (CRGE) strategy and Nationally Determined Contributions (NDCs), supporting the country's goals of reducing emissions and enhancing climate resilience. The project's comprehensive approach to water management and agricultural development provides a scalable model for other regions facing similar challenges, offering a sustainable pathway to development and poverty alleviation in Ethiopia's most vulnerable communities.
12. On a broader scale, the project's success is expected to have a transformative impact on Ethiopia's approach to climate resilience and sustainable development. By demonstrating the viability and benefits of solar water pumping and efficient irrigation, the project aims to catalyze a broader shift towards renewable energy and sustainable agricultural practices across the country. This aligns with Ethiopia's national development goals and international commitments, including the Sustainable Development Goals (SDGs) and the Paris Agreement. The project's integrated and comprehensive approach offers a blueprint for scaling up similar initiatives in other regions, contributing to global efforts to combat climate change and enhance resilience in vulnerable communities.

B.1. Climate context (max. 1000 words, approximately 2 pages)

13. The climate context for Ethiopia highlights the pressing need for climate adaptation measures to tackle the challenges posed by climate change in various sectors of the economy and the welfare of its population.

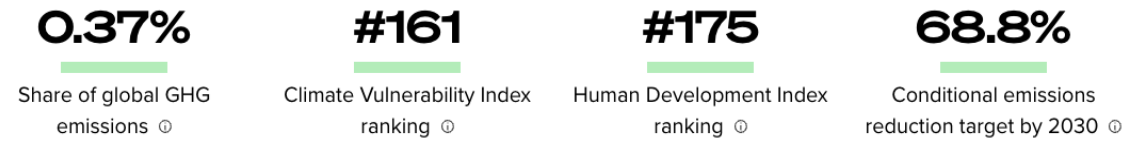


Figure 1 Ethiopia's share of global GHG emission, climate vulnerability, human development and NDC re duction target

14. **Ethiopia is one of the world's most drought-prone countries** and has been ranked 5th out of 184 countries in terms of its risk of drought. The country is faced with increasingly unpredictable rains, and in some years the complete failure of seasonal rains – occurrences that are linked to climate change. Between 1900 and 2010, twelve extreme droughts were recorded (killing over 400,000 people and affected over 54 million people).[8]

15. **Ethiopia is also ranked 34th out of 162 countries in terms of flooding risk, and 5th out of 162 in terms of landslide risk**. The increase in severity of short, heavy rains in the highlands leads to increased flooding in the lowlands, causing further soil degradation in already exposed areas (although it can also decrease fertility). Changes in temperature and rainfall increase the frequency and severity of extreme events.

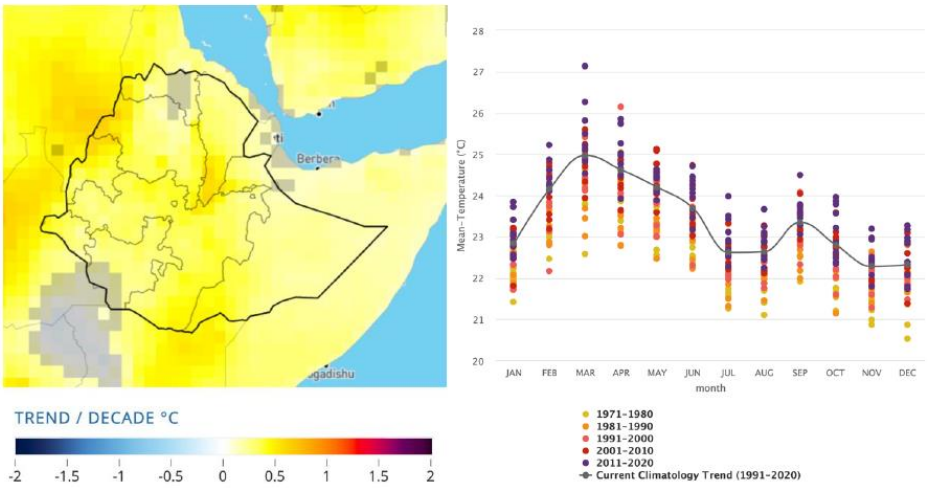
16. **Historical climate trends indicate exacerbated droughts, and desertification** in the lowlands of the country is expanding. In general, the lowlands of Ethiopia are vulnerable to increased temperatures and prolonged droughts that may affect livestock rearing. The highlands on the other hand suffer from more intense and irregular rainfall, leading to erosion, which together with higher temperatures will result in lower agricultural production.

17. **Future projections of temperature and rainfall patterns in Ethiopia exhibit a high degree of uncertainty**, but most projections agree that mean annual temperature is projected to increase by between 1–2°C by 2050. The frequency of hot days and nights will substantially increase. About 15–29 percent of days will be considered hot by 2060. It is uncertain whether rainfall will increase or decrease; projections range from -25 percent to +30 percent by 2050. There is an increase in the proportion of total rainfall that falls in "heavy" events with annual increases of up to 18 percent. In Ethiopia water supply will be affected throughout the country, but most severely in areas that are already water scarce, such as densely populated parts of the

[8] UNOCHA (2022): Situation Report, July 2022, https://reports.unocha.org/en/country/ethiopia/ (accessed July 28th, 2022).

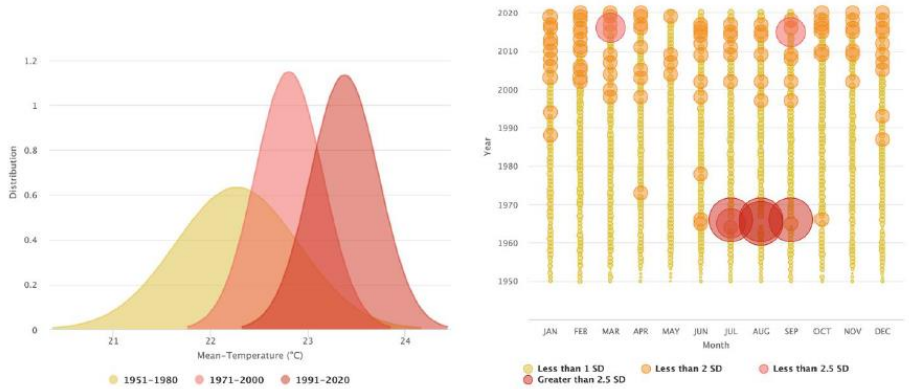
Rift Valley and eastern pastoralist zones. (*Refer Annex 2, paragraphs 10 - 25 for a more detailed assessment of historical, current and future climate risks and impacts*).

Figure 4 Mean temperature trend per decade (left) & Variability and trends of mean – temperature across seasonal cycle (right), 1971 - 2020; Ethiopia



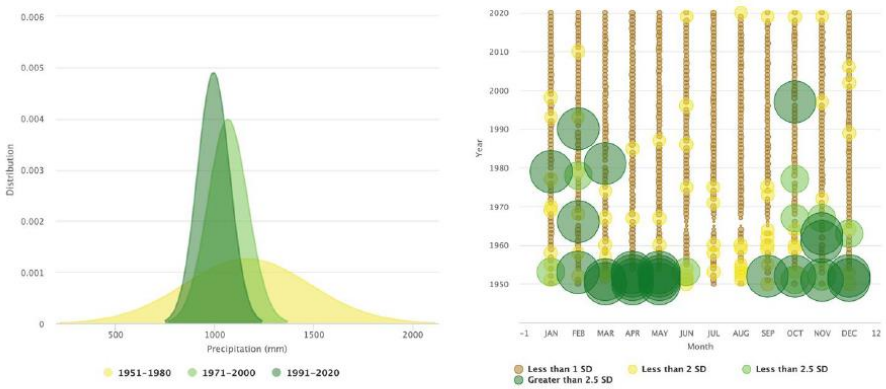
*Climate Change Knowledge Portal, World Bank

Figure 5 Change in distribution of temperature (left) & Change in event intensity of temperature (right), 1971 - 2020; Ethiopia



*Climate Change Knowledge Portal, World Bank

Figure 7 Change in distribution of precipitation (left) & Change in event intensity of precipitation (right), 1951 - 2020; Ethiopia



*Climate Change Knowledge Portal, World Bank

Figure 2 Change in distribution of temperature and precipitation

Health, social and environmental concerns due to water stress

18. Ethiopia has abundant water resources and contains the headwaters of numerous transboundary rivers, including the Nile. Key water stress metrics suggest Ethiopia is water stressed. Total annual renewable water resources per person are 1,162 m3, which is below the Falkenmark Water Stress Indexi threshold for water stress and just above the water scarcity threshold. The ratio of water withdrawals to supply is 32 percent, which exceeds the SDG 6.4.2ii threshold for water stress. Water stress is most evident at the sub-national level and seasonally in some locations[9].
19. In rural Ethiopia, 31% of the population (>26 million people) travel more than 30 minutes to collect drinking water; 28% use untreated surface water. 43 million people do not have hand washing facilities[10] and 60-80% of communicable diseases in Ethiopia are caused by inadequate access to safe water and sanitation.[11] Water sources are often contaminated with human and animal waste and related diseases are the leading cause of death in children under five.[12]
20. Irrigation is the largest source of demand for surface water. Approximately 85 percent (around 9,000 MCM per year) of all water withdrawals are for irrigation, mostly from surface water. Only 10 percent of municipal and industrial withdrawals are from surface water. Almost 2 million hectares (ha) are irrigated, mainly in the OmoGibe and Rift Valley Basins, although most irrigation is seasonal.[13]
21. Groundwater accounts for 90 percent of domestic/municipal and industrial supply. Around 70 percent of rural water supply is from groundwater, with comparable usage rates (60 percent) in Addis Ababa. Groundwater dependency is highest in the more arid Wabi-Shebelle and Ogaden Basins, although groundwater is not very accessible in some regions due to its depth.46 Pastoralists in these basins also depend on groundwater for

[9] https://winrock.org/wp-content/uploads/2021/08/Ethiopia_Country_Profile-Final.pdf.

[10] UNICEF; WHO (2019): Progress on household drinking water, sanitation, and hygiene: 2000-2017, Special focus on inequality, WHO, New York

[11] UNICEF (2018): Water, sanitation, and hygiene (WASH) program - Ethiopia, UNICEF

[12] Usman, Muhammed; Gerber, Nikolaus; von Braun, Joachim (2016): The impact of drinking water quality and sanitation on child health: Evidence from rural Ethiopia, in: The Journal of Development Studies, 55, p. 2193-2211

[13] https://winrock.org/wp-content/uploads/2021/08/Ethiopia_Country_Profile-Final.pdf.

livestock watering and agriculture to complement ephemeral surface water sources. Groundwater use in irrigation is low.[14].

FIGURE 1: MAP OF WATER RESOURCES

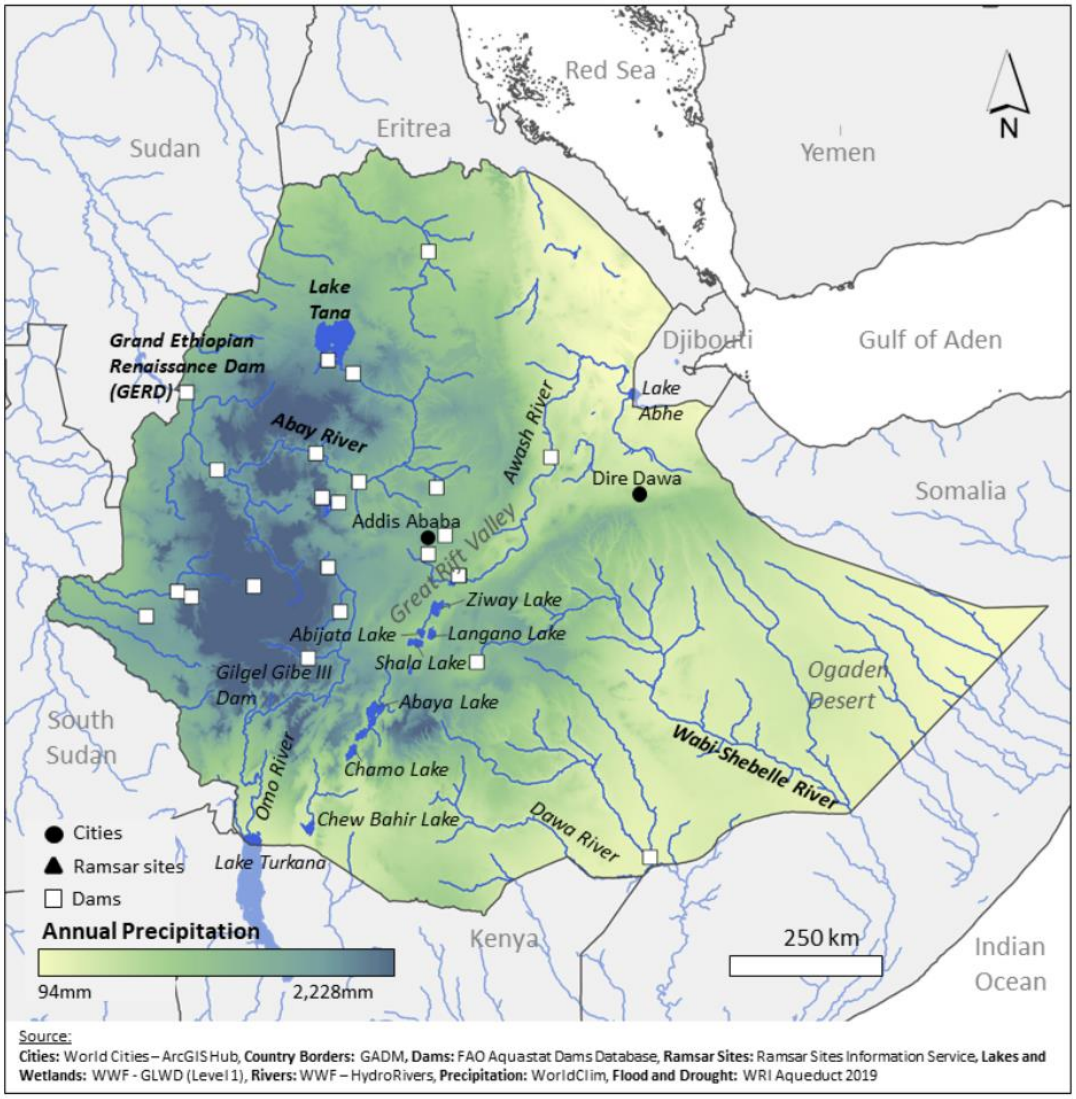


Figure 3 Map of water resources

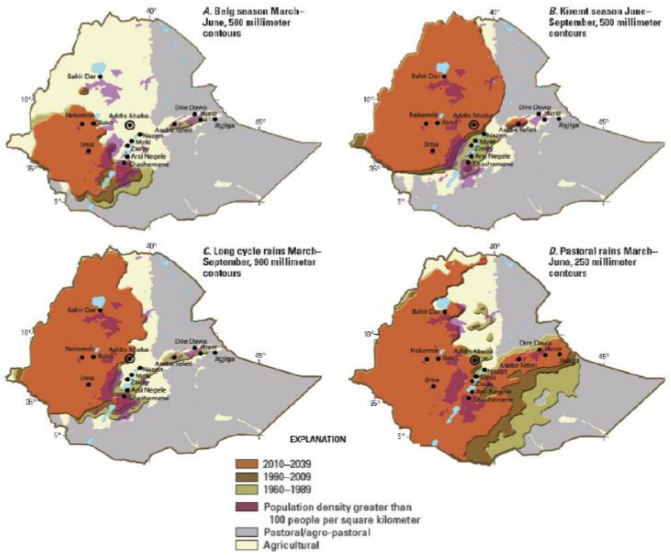
Agriculture, the backbone of the economy at risk due to climate change.

22. Ethiopia's agricultural production accounts for 40% of GDP, 80% of exports and an estimated 75% of the country's workforce. Yet, Ethiopia's rural communities predominantly depend on rain-fed agriculture, rendering them highly vulnerable to biophysical climate impacts.

23. Climate trends differ for the various regions and seasons known in Ethiopia for rainfall and temperature in different seasons/regions. The largest precipitation decrease during the driest quarter of the year will be in regions that are already very dry. Studies concluded that rainfall reductions will be concentrated in areas of great significance for food production: the area suitable for cultivation during the Belg season (February - May) may be reduced by another 16 percent, while the areas benefiting from Kiremt rains will also contract further. (*Ref: Annex 2, paragraphs 21-22, for detailed assessment)*.

[14] Ibid.

Figure 10 Changing Production Areas (past, present and future)



*Source: USGS et al. (2012)

Figure 4 Changing production area

24. Pastoralism remains the predominant land use in Ethiopian lowlands, covering 54 to 61 percent of the country's surface area. It is estimated that there are 10 million pastoralists in Ethiopia, the largest pastoral population in Africa. Agro-pastoral and pastoral communities, dependent on rangelands or mixed livestock–crop systems, face climate impacts such as degradation in rangelands, invasive species that affect grazing lands, reduction in water availability for human and animal consumption, and livestock diseases.

Ongoings droughts impacted food security and livelihoods.

25. Chronic food insecurity affects 10 percent of the population (over 10 million people), even in years with sufficient rains. The key rural livelihood systems – crop cultivation, pastoralism and agro-pastoralism – are highly sensitive to climate. These changes also hamper economic activity and aggravate existing social and economic problems.
26. Correlations have been found between rainfall and temperature variations and variations in stunting and underweight in Ethiopia, suggesting that climate change will exacerbate the current situation. Ethiopia has established a Productive Safety Net Program (PSNP) through which millions of people, receive assistance– but this may not be sufficient if productivity is further limited in the future. Food insecurity is most pronounced before harvesting, when food stocks have finished. While most of the country has one hunger season per year (June - September), the eastern pastoralist have two (February - April and September - October).
27. According to the OCHA Drought situation update as of March 2023, pastures and water availability are depleted in southern and eastern zones of the country, further endangering already depleted livelihoods. In Borena, over 800,000 people need emergency assistance, including water rationing and food support. Prolonged drought has reportedly displaced nearly 372,200 people. As per the same report released on 26 April 2024, roughly 45,000 people are expected to be affected in Amhara, with 3,000 displaced in North Wello, South Wello, and the Oromo special zone[15].
28. The World Bank's most recent climate and development report for Ethiopia alarmingly describes estimates from a recent survey of pastoral communities – which includes the Borena region – which "suggests that a contemporaneous drought shock reduces consumption by 15 percent, in line with previous estimates of the impacts of drought in Ethiopia. As a result of the prolonged drought, 13 million are estimated to be with

[15] https://reports.unocha.org/en/country/ethiopia?start=1047

insecure access to water, 1.4 million children are at risk of dropping out of school, and 4 million livestock have died."[16]

Climate change impacting already a weak economy, the poorest, and the most vulnerable:

29. **75% of farmers in Ethiopia are smallholders who work on farms of about 2 acres, earning $707 per year on avera**ge. Climate change will have significant economic effects on the Ethiopian economy, and on the agricultural sector due to factors such as the loss of arable land due to shifting agro-ecological zones, altered growing cycles that delay planting, and increased incidence of pests and diseases. Ethiopia's agricultural production accounts for 40% of GDP, 80% of exports and an estimated 75% of the country's workforce. Spectral analysis showed severe droughts to recur increasingly frequent, with herd mortality amounting to more than 26%[17].

30. Research increasingly underpins the persistence of economic costs caused by climate extremes as a major driver of losses in GDP.[18] It has been estimated that climate change will affect the country's GDP growth by 0.5 - 2.5 percent per year in the near future with the potential reduction of GDP up to 10 percent by 2045 primarily through impact on agricultural productivity. It is estimated that about US $ 2 billion will be lost in the agricultural sector in the next few years due to rainfall variability alone – equivalent to 32.5 percent of Real Agricultural GDP. (*Annex 2, refer to paragraph No. 27 provides a detailed assessment of the economic impacts of climate change and paragraphs 30 - 41 for specifics on the vulnerability of the agriculture, water, livestock and energy sector of Ethiopia*). The impacts of climate change are further compounded by skyrocketing food (average cost of a typical food basket has surged by over 60% in less than a year) and energy prices, and 35% inflation in the context of current geopolitical crises.19

31. Although Ethiopia is diversifying its economic base, the Home-Grown Economic Reforms (HERA) outlines that agricultural growth will remain an important driver of economic growth and poverty reduction. Agricultural productivity has grown rapidly in the past decade due to intensification of modern seeds, fertilizer use, and farm management techniques. To support this, the government has underlined that it will closely work with smallholder farmers, cooperatives and private actors. In 2011, the Ethiopian Climate Resilient Green Economy (CRGE) strategy was launched, laying the foundation for integrated planning for climate-resilient development. Ethiopia's CRGE initiative aims to "climate-proof" its National Development Plan goals.

32. **Large percentage of population below the poverty line live in most climate venerable areas**: An integrated vulnerability assessment on climate change effects in Ethiopia's regional states found that the top five vulnerable states are Afar, Amhara, Oromia, Somali, and Tigray. These regional states are all heavily agriculture-dependent and also among the poorest in the country. Approximately 90% of people living in Tigray and Afar and 60-70% of those living in Oromia and Somali support their life on less than US$ 2 per day.

33. Climate change also has a **determinantal impact on labour productivity and health**. According to a UNFCCC/WHO report, considering a high emissions scenario, i.e. increase in temperatures of +4°C will bring about a project loss of 2 percent annual daily work hours for workers carrying out heavy labour (e.g., agriculture and construction) and an increase in heat related deaths among elderly people (65+) to over 65 deaths per 100,000 by 2080, compared to the estimated baseline of 3 deaths per 100,000 in 1990

34. **Women – and especially girls – are disproportionately affected by the impacts of climate change**. While Ethiopia achieved significant progress towards girls' education (enrolment rates increased from 51% in 2003/04 to 95% in 2016/17), only 53% finish primary school due to the need to help in the household. Some of their primary responsibilities, including the collection of water for drinking, cooking and washing, the collection of fuel wood, and the small-scale cultivation of subsistence crops. Long walking and queuing times result in girls investing up to 8 hours a day in water fetching, thereby preventing them from using this time for

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[16] World Bank (2024): Ethiopia Country Climate and Development Report, p. 27, https://www.worldbank.org/en/news/infographic/2024/02/28/infographic-country-climate-and-development-reports-ccdr-for-afe-ethiopia (accessed May 26, 2024)

[17] Ibid.

[18] Jarmo, Kikstra; Waidelich, Paul; Rising, James; Yumashev, Dmitry; Hope, Chris; Brierley, Chris (2021): The social cost of carbon dioxide under climateeconomy feedbacks and temperature variability, in: Environmental Research Letters, 16, p. 094037

[19] Kroll, Katharina (2022): War in Ukraine is compounding Africa's food crisis, Deutsche Welle, April 27, 2022, https://www.dw.com/en/war-in-ukraine-is-compounding-africas-food-crisis/a-61607419#:~:text=Aid%20organizations%20say%20they%20have,for%20even%20the%20most%20needy.&text=The%20war%20in%20Ukraine%20may,staples%20including%20bread%20and%20vegetables (accessed July 26, 2022)

education or productive purposes. Economic hardship even pushes families into child marriages to benefit from dowries from the husbands' families.20 An additional (indirect) effect of climate change is that women and girls have been found to be more vulnerable to sexual abuse since they have to travel to more remote sources of water. Despite the strong effects of climate change on their lives, the abilities of women and girls to cope with climate change effects are often significantly lower than men's due to their reduced access to information, markets, mobility, alternative income sources, and decision-making mechanisms.

National Socio-economic Vulnerabilities:

35. **Population and Demographics:** Ethiopia's population is diverse, with over 80 ethnic groups and numerous languages spoken throughout the country. The largest ethnic groups are the Oromo, accounting for about 34.4% of the population, and the Amhara, making up 27%. Other significant groups include the Somali (6.2%), Tigray (6.1%), and Sidama (4%)[21]. The population continues to grow rapidly, presenting challenges and opportunities for development efforts. As of May 2024, Ethiopia's population is approximately 129.7 million, making it the 12th most populous country in the world. This population growth represents a significant increase from previous years, with an annual growth rate of about 2.47%[22].

36. **Agriculture-Based Economy**: Ethiopia's economy is primarily agrarian, with agriculture being the main livelihood for a significant portion of the population. Major crops include coffee, cereals, oilseeds, and pulses. However, the reliance on rain-fed agriculture makes the country vulnerable to climate variability and recurrent droughts. The increase in drought and desertification from land use pressures have resulted in significant losses of arable land and increased dependency on food aid. Droughts alone can reduce total GDP by 1 to 4 percent while soil erosion reduces agricultural GDP further (2 – 3 percent) without adaptation by 2045 (World Bank 2010). Just 5 percent of land is irrigated and crop yields from small farms are below regional averages. Moreover, pastoralists' livelihoods center on livestock, which is highly vulnerable to drought, leading to existential risks.

37. **Poverty and Inequality: Ethiopia faces high levels of poverty, particularly in rural areas**. Although national poverty reduced from 30% to 24%, there were strong differences in the nature of poverty reduction in urban (reduction from 26%-15%) versus rural areas (reduction from 30% to 26%) over the same period[23]. There are significant disparities in income and access to basic services between urban and rural populations. Efforts to reduce poverty and inequality have been ongoing, but there remain significant challenges. The percentage of the population living below the international extreme poverty line of $1.90 per day remains high, particularly in rural areas. Ethiopia's Gini index, which measures income inequality, is 39.1 as of the latest data. This figure shows significant inequality, reflecting the disparity in income distribution across different population segments. Income levels vary significantly between urban and rural areas. Urban areas generally have higher income levels and better economic opportunities, while rural areas struggle with lower incomes and limited access to markets and jobs. The median income in 2023 was estimated at USD 850. Access to healthcare services is better in urban areas compared to rural regions. Rural areas often face challenges such as inadequate medical facilities, shortages of healthcare professionals, and long distances to healthcare centers. Educational attainment is higher in urban areas, with better access to schools and educational resources. In contrast, rural areas suffer from insufficient schools, lack of trained teachers, and poor infrastructure, which affects overall educational outcomes[24].

38. **National economy**: **Ethiopia is a least developed country with growing economy.** In 2023 Ethiopia reached an estimated GDP scale of 156.1 billion dollars nominal, for PPP the country's economy has reached an estimated 393.85 billion dollars. This mostly comes from a services-based economy with agriculture. Ethiopian economy has a large foreign debt and very low-foreign reserves, i.e. 2.4 billion dollars of,

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[20] Davies, Lizzie (2022): Ethiopian drought leading to 'dramatic' increase in child marriage, Unicef warns, The Guardian, April 30, 2022, https://www.theguardian.com/society/2022/apr/30/ethiopian-drought-leading-to-dramatic-increase-in-child-marriage-unicef-warns#:~:text=2%20months%20old-,Ethiopian%20drought%20leading%20to%20'dramatic'%20increase,in%20child%20marriage%2C%20Unicef%20warns&text=Drought%2Dafflicted%20areas%20of%20Ethiopia,head%20of%20Unicef%20has%20said. (accessed July 26, 2022)

[21] World Population Review: Ethiopia Population 2024.

[22] Ibid.

[23] https://www.worldbank.org/en/country/ethiopia/publication/ethiopia-poverty-study-reveals-overall-poverty-declined-but-inequality-remains.

[24] https://pip.worldbank.org/

representing a decline compared to previous years, making it vulnerable to global energy price rises and limiting import of clean energy technologies. (*Ref: Annex 2, paragraphs 42-49, for details)*

39. **Political landscape affected stability and development progress in some regions:** Ethiopia has experienced political changes and challenges over the years, with the government working towards political reforms and democratization. However, there have been ethnic tensions and conflicts that have affected stability and development progress in some regions.

Limited infrastructure for irrigation and safe water supply to improve livelihoods and address climate shocks:

40. Only 5% of land is irrigated. If irrigation is being practiced, energy is generated from emission-intensive diesel generators, as large tracts of the rural population do not have access to the electricity grid. Existing diesel based projects face significant changes of high cost of fuel, lack of service and replacement parts. Solar water pumping has so far not been widely used due to access to finance and lack of experience (IWMI 2018). Solar PV pump irrigation has the potential to transform 18 percent of rainfed land in Ethiopia.

Green grid with limited access to energy to drive economy and development:

41. Ethiopia boasts significant potential for renewable energy, with abundant sources like wind, solar, and geothermal, making up the bulk of its electricity grid, which is almost entirely powered by renewables. However, despite this potential, 70% of Ethiopians lack access to electricity, affecting essential services like schools and clinics. The country's heavy reliance on hydropower, vulnerable to climate change, exacerbates the challenge. To address this, the Government launched the National Electrification Program (NEP) in 2017, aiming to provide 65% of the population with grid electricity and the remaining 35% through off-grid solutions.

42. The NEP not only acknowledges climate change's impact on hydropower but also integrates the Energy-Water Nexus and also embeds the Energy-Water Nexus and builds on the Agricultural Transformation Agency (ATA) Agricultural Commercialization Clusters (ACC) initiative. (Ref: *Annex 2, paragraphs 42-49, for details).* In Ethiopia, the availability of shallow groundwater offers the potential to use solar-powered irrigation systems for irrigation purposes. However, the market for solar irrigation in Ethiopia is underdeveloped and farmers are unable to afford such systems. The Ministry of Irrigation and Lowlands (MoIL) distributed 54,000 solar water pumps to cultivate some 280,000 hectares in the first nine months of FY 2022/23. It also decided to end imports of water pumps that run on diesel and/or gasoline and instead focus on green energy options

as of May 2023. GOE's NEP 2.0 target is to irrigate seven million hectares of small-holder farms using solar pumps.

Table 1 - Market Opportunities of Productive Use of Renewable Energy

- High market readiness level: The technology is ready to be scaled up and commercialized.
- Medium market readiness level: The technology is still in the piloting stage. It needs to be refined and perfected before it can be used on a large scale.
- Low market readiness level: The technology has not yet been proven to be commercially viable. It needs to be shown to be profitable and scalable before it can be brought to market.

Market Application	Technologies	Market Readiness Level (MRL)
Agriculture and Agro-processing	Solar water pumps for irrigation, primarily for cash crops	High
	Solar-powered hydroponic fodder for animal feed	Low
	Solar mills for agro-processing, primarily for grain milling	Medium
	Solar-powered sprinkler systems and drip irrigation systems	High
	Cold chain storage in horticulture value chains	Medium
Livestock, dairy, and poultry industries	Milking machines for animal husbandry	High
	Cooling / storage tanks for dairy	High
	Solar-powered butter churner and cream separator	High
	Solar-powered poultry shed lighting and heating	High
	Solar milk cans used for the distribution and transportation of milk	Medium
Micro, Small, and Medium Enterprises (MSMEs)	Solar-powered barber kits and hair clippers	High
	Solar charging stations for mobile phones	High
	Solar TV and solar refrigerators for restaurants and other businesses	High
	Solar lighting for extended business hours	High
	Solar sewing machines for small-scale garment businesses	Low
	Coffee washing for small coffee shops	Low
Transport: E-mobility	Electric two and three-wheelers for rural communities	Low
	Cold storage rooms in vehicles for the transportation of goods	Low
E-cooking	E-cooking gadgets, primarily stoves	Low

Figure 5 Market Opportunities for productive use of renewable energy (Source Googla Report)

Situation in project target areas

Kobo-Girana Valley – Amhara Region

43. Kobo Woreda is one of the eight rural districts in North Wollo Zone in the North Eastern part of Amhara National Regional State of Ethiopia. The socio-economic conditions in the area are characterized by high population growth, subsistence agriculture, limited income diversification, and significant poverty and food insecurity. The agriculture sector in the Kobo-Girana valley is primarily based on mixed farming, with both crop cultivation and animal rearing being common practices among farmers. However, this traditional farming system relies heavily (over 85 percent) on rainfed subsistence methods, utilizing basic and traditional farming tools with minimal inputs. Climate change-induced factors such as erratic rainfall patterns, temperature variations, and crop pest attacks exacerbate the challenges faced by farmers, leading to low agricultural productivity.

44. Land fragmentation due to population increase has resulted in small landholdings for most households, exacerbating challenges related to land scarcity, soil degradation, and low input utilization. The average farm size in the Amhara region of Ethiopia is approximately 1.09 hectares. Specifically, in Kobo Woreda, the average farm size is around 0.75 hectares. This smaller farm size is typical of the region's mixed farming system, which heavily relies on rainfed agriculture and traditional farming methods. Efforts to improve agricultural productivity in these areas often focus on enhancing irrigation infrastructure and adopting modern farming techniques to mitigate the challenges posed by reliance on rainfed systems. Despite efforts to improve livelihoods, many rural residents continue to face socio-economic difficulties. The conflict that

erupted in 2020 at the backdrop of the devastating impact of COVID- 19 and locust infestation crisis in the Kobo Girana Valley has reduced the coping capacity and challenged the resilience of the local communities.

45. Livestock production in the Kobo-Girana valley is primarily for subsistence and traction power, with minimal output of milk and meat. Challenges such as dwindling grazing land, disease outbreaks, and inadequate husbandry practices plague the sector, while non-farm activities remain underdeveloped as alternative livelihoods. Despite recent shifts towards non-agricultural activities due to rising poverty, low income persists due to limited competitiveness, access to credit, technical support, and entrepreneurship, compounded by the agricultural sector's vulnerability and reliance on annual production volumes.

46. The Kobo pressurized irrigation project was launched in 1998 to address food insecurity in the valley, followed by the establishment of the Kobo Girana Valley Development Program Office in 1999 to enhance food security through irrigation development. Various studies and drilling activities show alluvial deposits layers of gravel, sand, silt, and clay, with sediment aquifer thickness ranging from a few meters to 170 meters. Groundwater depth varies across the valley, with shallower conditions expected near dry riverbeds and deeper depths along the volcanic ridge of Mendefera.

47. Large-scale irrigation is absent in the area, with groundwater-based irrigation initiated by the regional government and managed by the Kobo-Girana Valley Development Project since 2005. The aim is to enhance food security by reducing reliance on rain-fed agriculture. Although the Kobo District has a potential irrigable area of 20,000 hectares, only 5.5 percent has been developed. Extensive studies were conducted in the area and 236 highly productive boreholes were identified and drilled for irrigation purposes. At a later stage and mainly due to lack of finance, only 50 of these boreholes were fitted with submersible pumps that were powered by diesel generators. Currently, only 32 boreholes powered by diesel generators remain operational serving 15,000 large scale farmers and irrigating 1,500 hectares of land. However, these generators have become expensive to run, not reliable, frequently fail, discounting the carbon that has been generated thus far.

48. Farmers utilizing complementary irrigation methods have experienced increased income and improved livelihoods, but further investment in submersible pumps and irrigation systems is needed to fully utilize the remaining potential.

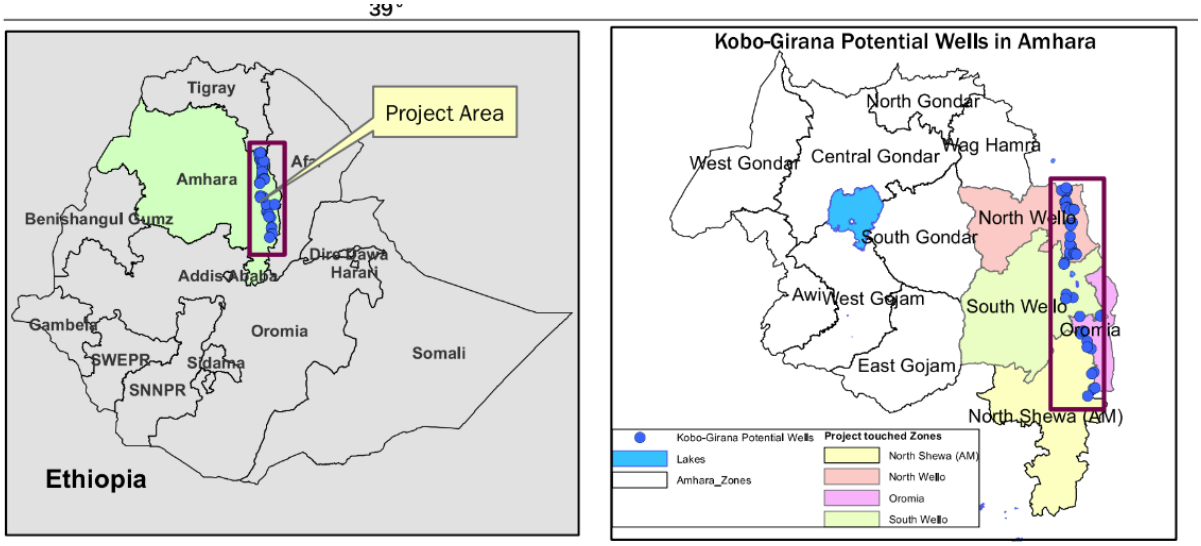


Figure 6 Map of Kobo Girana

Borena – Oromia Region

49. The community in this region is largely pastoralists that depend on livestock production for their livelihoods, with limited crop-livestock mixed farming system. Goats, sheep, cattle, donkeys and camels are the dominant sources of income and basis for livelihoods of the pastoralists. Some pastoralists cultivate cereal and pulse

crops with both Meher and Belg season rainfall – but, due to shortages of rainfall, not all cultivated land is currently productive.

50. In November 2021, approximately 68,000 animals have died (loosing almost 75percent of their livestock's) and over 1 million animals were in poor condition due to the impact of consecutive droughts in the previous years. According to ECDSWC, a total of over 30,000 households in Mermero kebele and Elkune kebele (Teltele Woreda) are supported by Productive Safety Net Program (PSNP) due to food insecurity caused by climate change[77]. Men with the remaining cattle's have been displaced in search of pasture and water, with women, children, elderly people and the weak cattle remain in the villages.

51. The feasibility study has shown that pastoralists in the Borana farming systems adopted a wide range of adaptation measures and tried to remain flexible to overcome what they perceived as changing climatic conditions. Supplementary feeding, off-farm employment and herd mobility to remote areas are the three most commonly used adaptive strategies pastoralists and their communities pursued as responses to climate change. (Ref Annex 2)

52. The Borena basin, situated in southern Ethiopia within a semi-arid climate and adjacent to Kenya, spans 18,000km² and lacks perennial surface water sources for domestic and agricultural use. Consequently, the area relies primarily on groundwater from intricate volcanic formations. Erratic rainfall patterns influence vegetation, rendering annual cropping impractical. The Borana community has developed sophisticated water management systems to support extensive livestock production, including cattle, camels, sheep, goats, and equines. Equitable access to water is ensured through a network of surface and groundwater sources, utilized seasonally and transitioning from temporary surface water sources in the wet season to permanent groundwater sources during the prolonged dry periods. While surface water carries contamination risks, groundwater from various traditional and mechanized wells is preferred for its reliability and reduced health hazards.

53. Management of water sources in the Borena basin varies, **with traditional wells, particularly the nine deep well complexes known as ela tula, representing the most intricate systems. Each well is overseen by a clan representative responsible for day-to-day maintenance and coordination of repairs**. While women collect water daily, strict three-day rotations ensure equitable watering of cattle, fostering high levels of cooperation and organization within the community. Despite significant local resource mobilization for well development and repair, concerns over drinking water scarcity persist, exacerbated by drying ponds and declining groundwater levels.

54. Extensive studies were conducted in the area and 113 boreholes have been drilled and constructed of which, only 13 powered by diesel generators are operational.

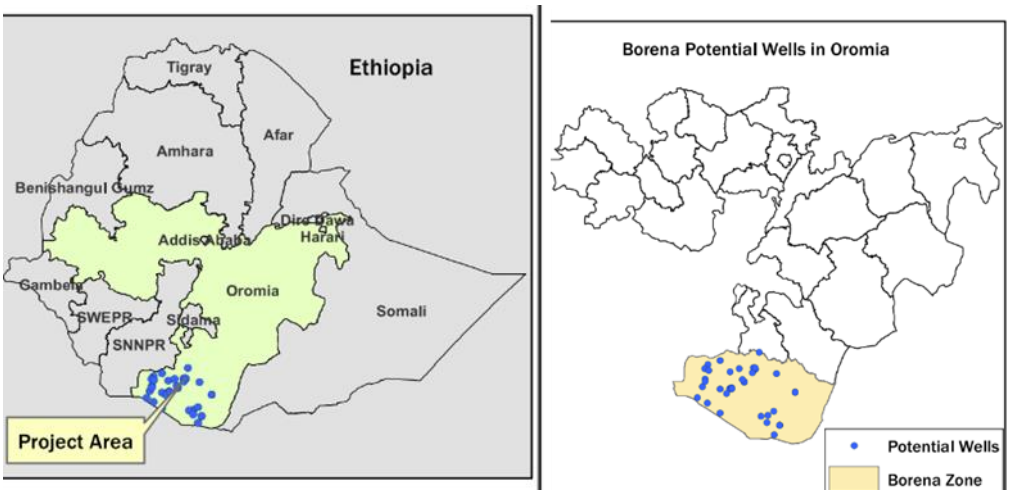


Figure 7 Map of Borena

Ethiopia's climate action focus on mitigating emissions and enhancing resilience.

55. Ethiopia submitted its first Nationally Determined Contribution (NDC) to the UNFCCC in 2017, with a revised version in 2021. The updated NDC pledges a significant reduction in greenhouse gas emissions by 2030,

aiming for carbon neutrality by that year. This ambitious target, contingent on international support and conducive investment environments, is based on Ethiopia's Climate Resilience Green Economy (CRGE) Strategy. The strategy focuses on mitigating emissions and enhancing resilience to climate change impacts, particularly in agriculture and forestry, which are vital for national income and livelihoods. Ethiopia's vulnerability to climate change threatens food security and economic growth, emphasizing the urgency of adaptation measures outlined in the CRGE strategy. Additionally, recognizing the interdependence of water and energy, the government highlights their pivotal roles in achieving both climate resilience and broader development goals, with planned investments totaling around US$7.2 billion. (Ref: *Annex 2, paragraphs 63-69, for details)*. Ethiopia is also a member of the African Climate Change Adaptation Program (ACCAP) and is working with other African countries to develop and implement climate adaptation plans[25].

56. **National** Adaptation **Plan (2017):** Ethiopia has developed its National Adaptation Plan (NAP) to address the challenges posed by climate change and enhance the country's resilience to its impacts. The plan focuses on integrating climate change considerations into national development policies and programs, aiming for a coherent and coordinated approach to climate adaptation. Through the NAP, Ethiopia aims to enhance the adaptive capacity of communities, promote sustainable resource management, and build climate resilience in sectors such as agriculture, water resources, health, and infrastructure. The plan emphasizes the importance of participatory approaches, engaging stakeholders at all levels, including local communities, to ensure inclusivity and ownership in the implementation process. In this regard, the NAP includes the following targets[26]:

- Actively involving local communities in the planning and implementation of adaptation measures to ensure that interventions are tailored to local needs and conditions.
- Promoting programs that empower women and youth to participate in adaptation activities, ensuring their voices are heard and they benefit from the outcomes.
- Establishing platforms for collaboration among various stakeholders, including government agencies, non-governmental organizations, private sector, and local communities, to foster shared responsibility and collective action.
- Enhancing the capacities of stakeholders at all levels through training and education to improve their ability to participate effectively in adaptation processes.
- Incorporating participatory planning processes that involve stakeholders in the decision-making, ensuring that adaptation strategies are inclusive and reflective of diverse perspectives.
- Implementing feedback mechanisms that allow stakeholders to provide input and suggestions, thereby improving the responsiveness and effectiveness of adaptation measures.
- Strengthening decentralized governance structures to facilitate local-level decision-making and implementation of adaptation activities.
- Providing institutional support to local governments and community organizations to enhance their role in adaptation planning and implementation.
- Supporting community-led initiatives and traditional ecological knowledge in developing adaptation practices.
- Aiming for gender-balanced participation in adaptation activities to ensure that women and marginalized groups are equally involved and benefit from adaptation measures.
- Enhancing the role of local institutions in facilitating community engagement and participation.
- Encouraging the adoption of community-based natural resource management practices to ensure sustainable use of resources.

[25] *African Climate Change Adaptation Program (ACCAP) (2020). Ethiopia Country Profile. Nairobi: ACCAP.*

[26] Ethiopia’s Climate Resilient Green Economy National Adaptation Plan May 2019 Federal Democratic Republic of Ethiopia

B.2 (a). Theory of change narrative and diagram (max. 1500 words, approximately 3 pages plus diagram)

Theory of change and project goal

57. The following diagram shows the ToC for the project, which illustrates the change pathway and interactions of different elements of the intervention logic proposed by the project. As shown in the theory of change diagram, the project has established an integrated self-supporting approach, addressing the identified barriers and risks. The project's outcomes and outputs are in-line with GCF's mitigation and adaptation goals and objectives. The theory of change shows that **IF** access to finance and improved adequate institutional and human capacity is provided to fit existing deep boreholes with solar water pumping systems, **THEN** agricultural productivity and community resilience will increase and contribute to NDC/NAP targets as well as the medium term development plan of Ethiopia **BECAUSE** reliable water access enables vulnerable communities to adopt more sustainable agricultural practices, increasing their productivity, and enhancing their ability to respond to current and future impact of climate change.

58. The ToC diagram, goal statement responds to a series of activities, outputs and outcomes, which addresses the barriers and risks described below.

59. **Starting situation:** Around 89% of farmers in the two target regions depend on rainfed agriculture practice and do not have access to irrigation for their agriculture-based livelihoods.[27] This strong reliance on seasonal rainfall renders the agriculture sector to be highly vulnerable to adverse climate change impacts. According to the government's flagship 10 Years Development Plan (10YDP) until 2030, which is fully aligned with Ethiopia's NDC, pastoral zones cover 62% of the country's area accounting for 12% of the population and 26% of the total livestock. The 10YDP adds that these pastoral areas are desert and semi-arid zones with high rainfall deficits and are subject to severe land degradation due to overgrazing, drought, and poor land and water management. Many rural households lack access to modern electricity services and safe water, both for drinking and irrigation[28], which has been exacerbated by current drought conditions. Water pumping for drinking and irrigation is often inaccessible, as operating diesel generators is expensive. While there is a nascent awareness of the potential benefits of using solar water pumping, access to finance and lack of experience have so far constrained uptake in Ethiopia[29] and the region.[30] The ongoing global energy and food crisis exacerbates the above situation significantly. The sky rocketing fuel and wheat prices leave Ethiopia highly vulnerable as the landlocked country strongly relies on imports.[31] The average cost of a typical food basket has increased by more than 60% in less than one year, going well beyond the means of the majority of the population.[32] Rolling out solar-powered water pumping systems for strengthening local food systems and community resilience is therefore a priority crisis response strategy of the GoE which addresses both short term external shocks, but also medium to long term climate vulnerability.

Identified Barriers

60. The following table describes the **barriers** that have thus far hindered the transformation of Ethiopia's water and agriculture sectors towards climate resilience by preventing a stronger uptake of SWP technology and how the project activities seek to overcome them.

Table 1 Project barriers and responses

Barriers	Baseline/starting situation	Project activity addressing barrier
Predominant dependence on **climate-vulnerable rain-fed**	Low baseline: 89% of farmers depend on rainfed agriculture	With lack of experience and awareness by farmers of the

[27] Kassawmar, Tibebu; Zeleke, Gete; Bantider, Amare; Gessesse, Gizaw; Abraha, Lemlem (2018): A synoptic land change assessment of Ethiopia's Rainfed Agricultural Area for evidence-based agricultural ecosystem management, in: Heliyon, 4, p. e00914

[28] Federal Democratic Republic of Ethiopia (2019): National Electrification Program 2.0 Integrated Planning for Universal Access, Addis Ababa

[29] International Water Management Institute (IWMI) (2018): Business Model Scenarios and Suitability: Smallholder Solar Pump-based Irrigation in Ethiopia, International Water Management Institute, Colombo

[30] Efficiency for Access Coalition (EFAC) (2019): Solar Water Pump Outlook 2019: Global Trends and Market Opportunities, Efficiency for Access Coalition

[31] World Food Programme (2022): Implications of the Conflict in Ukraine on Food Access and Availability in the East Africa Region, Update 3, June 2022, https://docs.wfp.org/api/documents/WFP-0000140223/download/ (accessed July 26, 2022)

[32] Devi, Sharmila (2022): Climate change driving east Africa towards famine, in: The Lancet, 400, p. 150-151

agriculture with negligible share of irrigation-supported agriculture**,** predominant **reliance on surface/shallow water** supply for irrigation and potable water	practice[33] and only an estimated 5% of rural farmers in the project regions use (diesel-powered) irrigation.[34] Medium to large scale solar Water Pumping has not been deployed in Ethiopia, even in activities supported by IFIs.(see feasibility study section A1)	benefits of SWP technology, this project seeks to change the "low baseline" to improve market penetration of SWP based on a highly replicable blueprint (overall project can be replicated across country). See activity 1.1. and 1.2 for detailed information.
Lack of efficient irrigation systems	Low baseline: The existing systems often result in significant water losses due to evaporation and inefficient distribution, are largely powered by costly and environmentally harmful diesel generators, and cover only a small fraction of the agricultural land, making farmers heavily reliant on unpredictable rainfall. This inefficiency leads to lower agricultural productivity, high operating costs, and environmental degradation. Additionally, these systems are often outdated, lacking modern technologies that could optimize water usage, and there are gaps in the capacity and knowledge of farmers and technicians to operate and maintain more efficient systems.	Deployment of efficient irrigation systems integrated with SWP technology to improve water use efficiency and agricultural productivity. See activity 1.1 and 1.2.
Limited effort to ensure gender and social inclusion in extension services, which excludes a proportion of the society from having access to technical capacity and information on irrigation and SWP systems as well as access to credit.	Low baseline: 23% of female farmers as opposed to 38% male farmers are likely to attend extension programs; while female farmers are 9% point less likely to access credit than their male counterparts (see gender assessment section I).	Project aims to ensure participation of women in water user groups and sustainable businesses including in leadership positions, with the appropriate training and consultation programs in place. (See gender action plan for detailed activities)
Limited **access to electricity** in rural areas	Low baseline: Access to electricity remains very low in rural Ethiopia, in particular for off-grid renewable energy for productive use such as irrigation. (see feasibility study section A2.5)	Deployment of SWP technology in two intervention areas will allow use of renewable energy as an innovative alternative to more widely known diesel pumps (even if diesel may also not have been affordable)
Very **high capital costs**, currency and other risks that prohibited private investments in solar water pumping to date.	Low baseline: High external debt, currency depreciation and macroeconomic instability incur very low safety margins for private foreign direct	Provision of grant finance for early stage market penetration of SWP to build confidence in users.

[33] Kassawmar, Tibebu; Zeleke, Gete; Bantider, Amare; Gessesse, Gizaw; Abraha, Lemlem (2018): A synoptic land change assessment of Ethiopia's Rainfed Agricultural Area for evidence-based agricultural ecosystem management, in: Heliyon, 4, p. e00914

[34] Mekonnen, D.K., G.T. Abate and Seid Yimam (2022): Irrigation and agricultural transformation in Ethiopia. IFPRI Project Note October 2022. Washington, DC: International Food Policy Research Institute (IFPRI).

	investments,[35] despite increasing economic attractiveness of SWP technology.[36] Due to low awareness in financial industry related to low market penetration of SWP, there is an absence of available financial instruments in the Ethiopian financial industry for financing SWP technologies.	Co-creation of appropriate financial instruments for farmers and households to access, operate and maintain SWP technology, which can be further scaled up with additional climate and private sector finance beyond the boundaries of the GCF support (see activity 2.3).
Limited paying capacity of end users to make investment or pay for water/energy services to establish a full private sector-based business model	Low baseline: These end users often lack sufficient income to afford the initial investment in modern irrigation and energy systems or to cover ongoing operational expenses. This makes it difficult to establish a sustainable, fully private sector-based business model for these services.	Highlight project components CAPEX based on grants, and OPEX paid by commercial users. Revolving Fund through RUSACCOs and agriculture services of extension workers to improve productivity/income levels. Also demonstrating improvements in income levels to establish/prove a base case for future private sector investments in scale up. (refer to activities 1.4.1, 1.4.2, 2.3.4)
National budgetary constraint, in particular financial instruments denominated in foreign currency**.**	Low baseline: Both solar power systems as well as irrigation infrastructure is not domestically produced and thus represent an import good denominated in foreign currency. Ethiopia is facing a general budget shortage, and a particular lack of forex for technology imports.[37]	Bypassing private market debt by seeking non-repayable support for climate resilience from the multilateral system to enable the market penetration of a proven technology that has not yet been taken up in Ethiopia. Provision of grant finance denominated in USD to purchase and install assets. (see activity 1.1-2, 2.3).
Limited institutional and technical capacity and awareness	Low baseline: Due to **general lack of experience with SWP technology** there is a resulting **misperception that solar water pumping is expensive** and unreliable among farmers, planners, policymakers and development partners (see feasibility study section 5.1, 5.2)	Capacity building and awareness raising for government officials farmers and, training for technicians. (see activity 2.2, 2.4).
Limited institutional and technical capacity: Lack of qualified technicians to operate and maintain renewable energy and irrigation infrastructure.	Low baseline: Since SWP has not been widely deployed, there is a lack of qualitied and experienced technicians (see feasibility study section 5.1, 5.2)	Technical training for national technicians, regulators, and policy-makers (see activity 2.4).

[35] Fitch Ratings (2022): Fitch Affirms Ethiopia at 'CCC', https://www.fitchratings.com/research/sovereigns/fitch-affirms-ethiopia-at-ccc-27-01-2022#:~:text=Ethiopia%20has%20an%20ESG%20Relevance%20Score%20of%20'4'%20for%20Creditor's,Ethiopia%2C%20as%20for%20all%20sovereigns (accessed July 26, 2022)

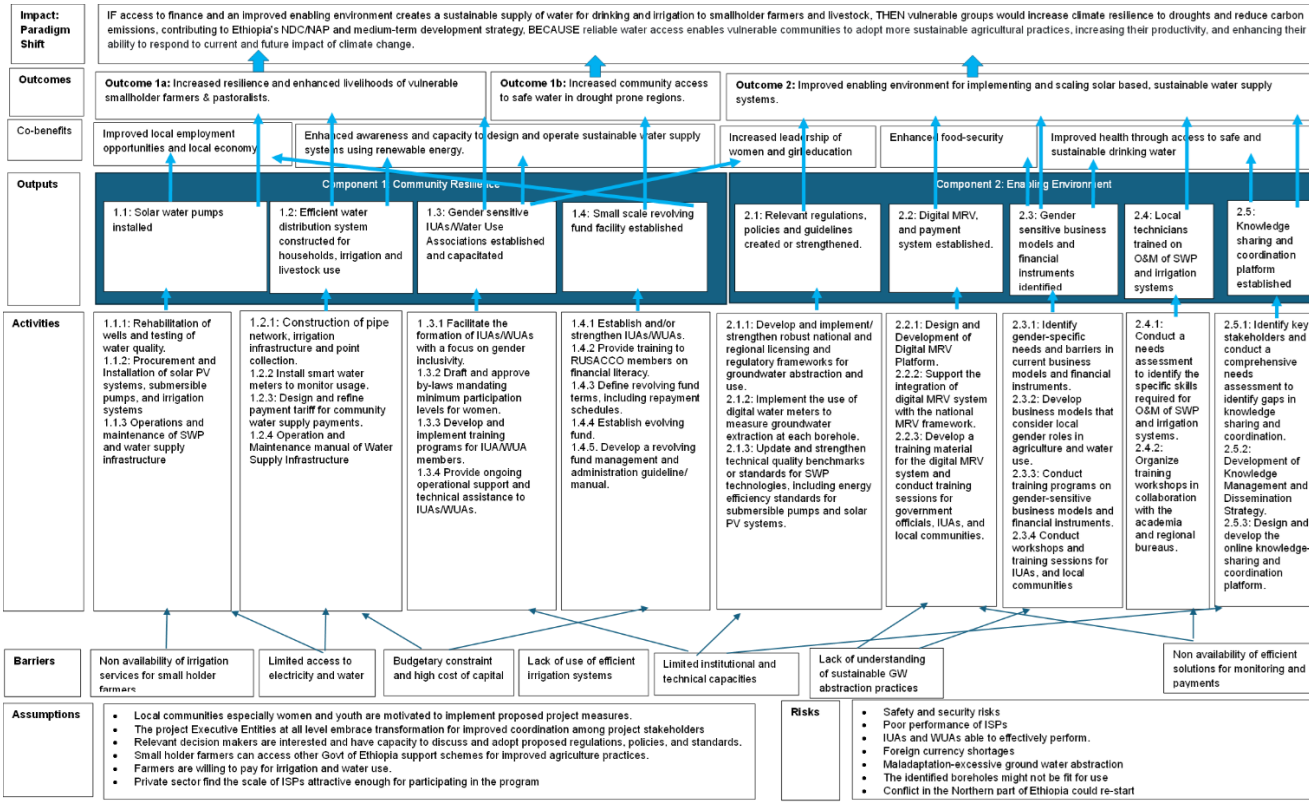
[36] IRENA (2016): Solar pumping for irrigation: Improving livelihoods and sustainability, The International Renewable Energy Agency, Abu Dhabi

[37] World Bank (2024): Ethiopia Country Climate and Development Report, p. 69

Ongoing regulatory constraints and lack of policy incentives.		
Lack of practices in sustainable Ground Water extraction	There is limited or no practice of sustainable ground water extraction as there is limited access to smart water meters and ground water monitoring devices	Project design include, geological and ground water assessments, water balance studies, digital technologies to monitor water flows, water use decision making based on water flows as best practices (see Activity 1.1, 2.1).
Limited institutional and technical capacity: Lack of experience with sustainable business models with gender-sensitive and inclusive community participation.	Low baseline: While there is vast experience rural agricultural and savings cooperatives in Ethiopia, these approaches have not yet been applied to SWP technologies and off-grid renewable energy more broadly (see feasibility study section 5.1, 5.2)	Local governance and implementation arrangements centered around gender-sensitive and inclusive community participation, integrated with provision of finance and technical expertise (see activity 1.3, 2.3).
Lack of monitoring and payments, which complicate money collection and administration.	Low baseline: Since off-grid electricity and water pumping technology have an extremely low market penetration, the use of digital technology for metering water and electricity flows, as well as payments is not common practice in Ethiopia (see feasibility study section 7)	Introduction of digital smart metering and payment systems in the project intervention will generate awareness for the benefits of digitalization (see activity 2.2). Establishment of community owned IUAs/Water Associations

All **project activities** overcoming these barriers are described in detail in section B.3. These activities are the basis for achieving the project's outputs, outcomes and overall goal contributing to shifting Ethiopia's development pathway towards a low-emission and climate resilient future. Sub-activities and milestones are described in Annex 5 (implementation schedule).

Figure 8: Visualization of the theory of change.



Project Co-benefits

The project will generate several co-benefits including:

- Improved health through improved access to safe & sustainable drinking water
- Improved local employment opportunities for rural communities
- Improvement of local economy through improved yield and food production
- Awareness raising and capacity building of local stakeholders
- Gender sensitive approaches mainstreamed

See section D.3 (sustainable development potential) for further details on the identified co-benefits, and section E.5 for the co-benefit indicators.

Assumptions and risks:

61. **Risks:** Project risks related to technical and operational, financial, governance and legal risks are described in detail in Section F, and environmental and social risks are described within Section G.1. Among others it includes:
    - Foreign currency shortage might hamper procurement of goods and services overseas;
    - Limited knowledge in operations and maintenance of solar powered submersible pumps;
    - The boreholes identified for the project and the ground water might not fulfil the physical and chemical characteristics that has been reported in the completion report;
    - Global supply chain disruption could continue and affect the time schedule of international procurement;
    - Conflict in the Northern part of Ethiopia could re-start;
    - Project assets could be vandalized due to lack of knowledge of the value and use of project;
    - Maladaptation of project outcomes as a result of excessive ground water abstraction;

62. **Assumptions**: The project design is based on the following assumptions (assumptions are further described in sections E.3 and E.5 for each relevant project indicator).
    - Local communities, especially women and youth are motivated to implement the proposed project measures and actively participate in operating and maintaining the systems through IUA/Water Use Associations;
    - The project executing entities at all level embrace transformation for improved coordination among the project stakeholders

- Farmers are willing to pay for the irrigation and water use
- Farmers able to use access other Govt programs
- Private sector find the scale of ISPs attractive enough for participating in the program.

63. **Innovation and additionality:** the project activities are highly innovative and additional in the Ethiopian context. The following attributes proposed by the GCF's innovation and additionality tool serve to illustrate and justify the additionality of the programme.

The proposed project activities cannot be regarded as "common practice"	In Ethiopia, overall irrigation and water pumping is only used in 5% of arable land, predominantly powered by diesel generators. SWP technologies have only been disseminated through very few international grant-based interventions (Adaptation Fund, DREAMS). No large size solar based pumping programs exist in Ethiopia
Project activity faces monetary and non-monetary barriers that prevent it from happening without concessional support (see above)	Ethiopia faces significant budgetary constraints and the domestic financial sector does not provide access to finance for SWP. Additional non-monetary barriers apply (see above).
Project activity in lower income country	Ethiopia is a low-income country with significant budgetary and fiscal constraints. The World Bank's recent Climate and Development Report for Ethiopia highlights that for mobilizing external finance, "grant/concessional finance will, for the foreseeable future, remain the most important (and the cheapest) source of external finance for climate purposes."[38]
Project activity includes knowledge transfer that enables development outcomes.	The project prioritizes strengthening the enabling environment by improving the policy and regulatory framework (activity 2.2 incl. legal frameworks, licensing, tariff-setting, efficiency standards, customs/tax exemptions and incentives for local assembly, gender-sensitive community participation), training and capacity (activity 2.4), as well as a knowledge sharing platform coordinated by the CRGE Facility (activity 2.5).
Benchmark and practices for sustainable use of ground water	The project aims to limit groundwater extraction to 0.8% of recharge rate ensuring sustainability and preventing depletion of water from surface water recharge. Implementation of smart meters for monitoring water use; training for local communities on sustainable water practices; adherence to strict extraction limits.
Community-Driven Operations through IUAs and WUAs	Strong community governance through IUAs and WUAs actively managing and maintaining SWP systems; increased local capacity and ownership. Training and capacity-building programs for IUAs and WUAs; establishment of community-led governance structures for effective management and maintenance of SWP infrastructure.
Project activity involves innovative financing structures.	The project involves co-creating appropriate financial instruments (first of its kind) for SWP technologies with local financial institutions (activity 2.3) and potentially promotes digital payments (activity 2.2)

64. The innovation and additionality of the intervention can also be further illustrated by contrasting the proposed activities with the most plausible **alternative scenarios**. Based on the climate and socioeconomic context presented above, in particular the specific barriers described above, the most plausible alternative water-supply scenarios are the following:
    1. Ground Water Vs Surface Water
    2. Solar Vs Diesel pumping
    3. Public grant vs Private sector

65. Alternative solutions of the rationale behind the consideration of solar technology as opposed to diesel pumping has been provided in detail and below

a) Ground water Vs. Surface Water

[38] World Bank Group (2024): Ethiopia Country Climate and Development Report, February 2024. CCDR Series. Washington, DC: World Bank. http://hdl.handle.net/10986/41114 (accessed May 6, 2024).

Groundwater extraction emerges as the best alternative under the given circumstances in Ethiopia for several compelling reasons:

1. Water Availability: As mentioned, surface water is not readily available in the targeted areas. In arid and semi-arid regions, groundwater often represents the only reliable water source, especially during prolonged dry periods. The IPCC's Africa fact sheet notes that climate change is exacerbating water scarcity in many parts of Africa, making groundwater an increasingly critical resource.

2. Climate Resilience: Groundwater sources are generally more resilient to short-term climate variability and droughts compared to surface water. The IPCC Interactive Atlas shows decreasing trends in mean precipitation for northeastern Africa, suggesting that surface water sources may become even less reliable in the future. Groundwater can act as a buffer against these climate-induced fluctuations in water availability.

3. Reduced Evaporation Losses: In hot, arid climates like parts of Ethiopia, surface water sources are subject to high evaporation rates. Groundwater extraction minimizes these losses, ensuring more efficient use of the available water resources.

4. Year-round Availability: Unlike seasonal surface water sources, groundwater can often be accessed throughout the year, providing a more consistent water supply for agriculture and domestic use. This is crucial for improving food security and livelihoods in the face of increasing climate variability.

5. Scalability and Decentralization: Solar-powered groundwater pumping systems can be implemented at various scales, from individual farms to community-level projects. This decentralized approach aligns with the challenges of providing infrastructure in dispersed rural settlements, as highlighted in the context about electricity access.

6. Potential for Agricultural Productivity: Access to groundwater can dramatically increase agricultural productivity, especially when combined with efficient irrigation techniques. This is crucial for building resilience in the agricultural sector, which the IPCC identifies as highly vulnerable to climate change in Africa.

7. Reduced Pressure on Surface Water Ecosystems: By relying on groundwater, the project can help reduce pressure on potentially fragile surface water ecosystems, which may already be stressed due to climate change and human activities.

8. Alignment with National and International Goals: Sustainable groundwater extraction aligns with Ethiopia's development goals and international frameworks like the Sustainable Development Goals, particularly those related to water security, food security, and climate action.

66. However, it's crucial to emphasize the importance of sustainable groundwater management and has been thoroughly incorporated under the water balance section in annex. This project is cognizant that over-extraction can lead to depletion of water from surface water recharge and other environmental issues and hence has emplaced necessary measures to avoid over abstraction.

b) Grid Vs Distributed Energy Supply

Access to reliable electricity remains a challenge in many rural and off-grid areas of Ethiopia for several reasons:

1. **Geographic terrain:** Ethiopia's rugged and mountainous terrain, particularly in rural areas, makes it difficult and expensive to extend the national electricity grid to remote communities.
2. **Dispersed settlements:** Rural settlements in Ethiopia are often widely dispersed, with low population densities, making it economically unviable for utility companies to invest in grid infrastructure for a relatively small number of customers.
3. **Limited infrastructure:** Many off-grid areas lack the necessary infrastructure, such as roads and transmission lines, which increases the costs of extending the grid.
4. **Poverty and affordability:** A significant portion of the rural population in Ethiopia lives in poverty, making it challenging for them to afford the costs associated with grid connection and electricity tariffs.

67. Regarding the **costs of extending the grid** versus using minigrid systems, there is a significant difference:
    1. **Grid extension costs:** The cost of extending the national grid to rural areas in Ethiopia can range from $15,000 to $30,000 per kilometer, depending on factors such as terrain, distance from the existing grid, and the required infrastructure (Source: World Bank, 2018).
    2. **Minigrid system costs:** The costs of installing a minigrid system vary based on the size, technology, and location, but generally range from $1,000 to $5,000 per kilowatt of installed capacity (Source: International Renewable Energy Agency, 2020).
68. For example, a 100 kW solar PV-battery minigrid system suitable for a remote village might cost between $100,000 and $500,000, depending on the specific components and installation requirements. In comparison, extending the national grid to the same village could cost several million dollars if the distance from the existing grid is significant. Thus, recovering the investment cost of the Utility becomes difficult as the power demand from the communities is very low as compared to the investment cost.
69. While the upfront costs of minigrids can be higher than grid extension in some cases, they offer a more cost-effective and scalable solution for providing electricity to dispersed rural communities, especially in areas such as the ones targeted in this proposal where the grid extension costs are prohibitively high.
    1. **Efficiency:** A study by the International Water Management Institute found that solar-powered irrigation systems in Ethiopia can be economically viable within 3-5 years International Water Management Institute: https://solar.iwmi.org/.
    2. **Cost-effectiveness:** The levelized cost of energy (LCOE) for solar PV water pumping systems in Ethiopia can be as low as $0.10 per kWh, making it more cost-effective than diesel-powered pumps in the long run (Source: International Renewable Energy Agency, 2019). The cost of solar electricity for irrigation can be as low as $0.03-$0.07 per kWh, compared to $0.15-$0.20 per kWh for diesel World Bank: 2018 Solar irrigation in Ethiopia, worldbank.org.
    3. **Environmental Benefits:** A 1 kW solar PV water pumping system in Ethiopia can offset approximately 1.5 metric tons of carbon dioxide emissions annually, compared to a diesel-powered pump (Source: Climate Technology Centre & Network, 2018).
    4. **Potential:** A World Bank report estimates that Ethiopia has the potential to develop 5 GW of solar power, enough to meet the irrigation needs of millions of hectares and build the adaptive capacity of its communities, World Bank: 2018 Solar irrigation in Ethiopia, worldbank.org.
70. As the costs of solar PV technology continue to decline and awareness of its benefits grows, more farmers and communities in off-grid areas of Ethiopia are expected to adopt solar-powered water pumping systems, improving agricultural productivity and food security while contributing to sustainable development goals.

c) Public Grant Vs Private Sector

Considerations why this proposal should be funded through public/grant resources as opposed to the private sector

1. Novelty of Solar Technology and Adoption in Ethiopia: Solar-powered irrigation is a relatively new technology in Ethiopia, with limited local experience and expertise. This novelty increases perceived risks for private sector investors, who typically prefer proven technologies with established track records. While technology adoption is thriving in Ethiopia, the uptake of solar irrigation technology is still in its early stages. This presents both a challenge and an opportunity – while initial adoption may be slow, there's significant potential for rapid growth once the technology proves its worth.

2. Financial Institution Awareness: Ethiopian financial institutions are more familiar with diesel-powered irrigation schemes, which have been the norm for decades. This familiarity makes it easier for them to assess risks and provide financing for diesel-based projects. Limited understanding of solar technology among local banks can lead to hesitancy in financing solar projects, or to unfavorable lending terms. In response to the persistent foreign exchange (FX) shortages that impede the importation of advanced irrigation technologies, MoIL is launching a dedicated FX facility. This facility will directly address these economic constraints by ensuring the availability of necessary funds to import solar-powered and water-efficient irrigation systems. These financial instruments are designed to democratize access to state-of-the-art irrigation technologies, thereby empowering smallholder farmers and promoting sustainable agricultural practices across the nation.

3. Need for De-risking: Given the above factors, there's a clear need to de-risk investments in solar-powered irrigation to attract private sector participation. Public and grant resources can play a crucial role in this de-

risking process, helping to bridge the gap between perceived and actual risks. Secure substantial public grant funding (e.g., from GCF, Adaptation Fund, or bilateral donors) to cover the majority of upfront capital costs. This reduces the financial risk for private sector participants and end-users.

- **Alternative Scenario 1: Lack of progress on improving access to water.** Without external technical and financial support, increased access to water for irrigation and household use will stagnate as imports of modern SWP technology are not feasible due to forex shortages, and the enabling environment will continue to be constrained by various barriers (see above). Adverse climate impacts may even potentially lead to decline in access to water.
- **Alternative Scenario 2: Expansion of business-as-usual technologies.** When accessible, water pumping has historically been powered by diesel generators in Ethiopia, which means that end-users are familiar with this technology, even if they can presently not afford it. Providing access to finance without strengthening the enabling environment and tailoring technical assistance to the specific requirements SWP requirements would with high probability lead to an expansion of diesel-generators for water pumping, especially because initial capex-investments are lower for diesel generators compared to SWP. This would lead to increased GHG emissions and dependency on fossil fuel imports, with negative macroeconomic impacts due to the burden on forex reserves.
- **Alternative Scenario 3: Private sector-led expansion of solar water pumping.** Decreasing technology costs and increasing market penetration in the region may incentivize the private sector to expand the use of SWP technologies without public grant or concessional finance. However, in the specific Ethiopian circumstances this is unlikely to materialize due to the barriers discussed above, in particular related to access to finance (especially forex needed for technology imports), and awareness and expertise.

71. As a result, the proposed interventions are clearly the most feasible and cost-efficient options, especially as they are benefitting rural end-users where some of the barriers may be amplified compared to peri-urban populations. Therefore, the additionality and innovation can be considered high. Moreover, the integrated approach of providing access to finance with strengthening the enabling environment is best-suited to contribute to a paradigm shift towards climate resilient access to water for rural communities in Ethiopia.

72. Innovation and additionality can be further illustrated by elaborating the following key features in more detail (see detailed description of activities in section B3):

Partnerships between federal, regional, and community levels
MoIL is proactively establishing robust partnerships at federal, regional, and community levels to ensure the successful deployment and sustainability of solar water pumping systems for drinking water and irrigation. By leveraging these multi-level partnerships, MoIL integrates a wide array of perspectives and expertise, creating a holistic approach that addresses local challenges with nationally supported solutions. These collaborations are fundamental in harnessing collective strengths, facilitating knowledge exchange, and ensuring that project implementations are well-adapted to local environments and community needs, thereby enhancing long-term sustainability and effectiveness.

Strengthen and disseminate gender-sensitive business models
The ministry is committed to transforming the role of women in our economy through the introduction of climate-smart technology for facilitating access to clean water. Associated businesses will be owned and operated by local women entrepreneurs, providing them with a sustainable business model that promotes gender equity. Such initiatives not only supports women's economic empowerment but also serve as a vital community resource, ensuring efficient water distribution and promoting health improvements through increased access to potable water.

Create an enabling regulatory environment
With the strategic support from the African Development Bank (AfDB), MoIL is set to develop a comprehensive national irrigation policy and regulatory framework this year. This crucial initiative aims to eliminate existing bureaucratic and regulatory hurdles that hinder the adoption of innovative water management technologies. By simplifying procedures and creating supportive policies, MoIL aims to foster an environment that is conducive to technological advancements and entrepreneurial initiatives in the irrigation sector. This regulatory overhaul will facilitate smoother project implementations, encourage private sector investments, and ensure that new technologies can be rapidly adopted on a wide scale.

B.2 (b).Outcome mapping to GCF results areas and co-benefit categorization

73. Each of the project Outcomes identified in section B.2(a) map to the GCF results area as follows:

Outcome number	GCF Mitigation Results Area (MRA 1-4)				GCF Adaptation Results Area (ARA 1-4)			
	MRA 1 Energy generation and access	**MRA 2** Low-emission transport	**MRA 3** Building, citiies, industries, appliances	**MRA 4** Forestry and land use	**ARA 1** Most vulnerable people and communities	**ARA 2** Health, well-being, food and water security	**ARA 3** Infrastructure and built environment	**ARA 4** Ecosystems and ecosystem services
Outcome 1a: Increased resilience and enhanced livelihoods of vulnerable smallholder farmers & pastoralists	☒	☐	☐	☐	☒	☒	☐	☐
Outcome 1b: Increased community access to safe water in drought prone regions	☒	☐	☐	☐	☒	☒	☐	☐
Outcome 2: Improved enabling environment for implementing and scaling solar based, sustainable water supply systems	☐	☐	☐	☐	☒	☒	☐	☐

74. The following co-benefits identified in section B.2(a) map to the following corresponding category:

Co-benefit number (compare to Outcome numbers above)	Co-benefit					
	Environmental	**Social**	**Economic**	**Gender**	**Adaptation**	**Mitigation**
Improved local employment opportunities and local economy	☒	☒	☒	☐	☒	☒
Enhanced awareness and capacity to design and	☐	☒	☐	☒	☒	☐

operate sustainable water supply systems using renewable energy.						
Increased leadership of women and girl education	☐	☐	☒	☒	☒	☐
Enhanced food-security	☐	☐	☐	☐	☒	☒
Improved health through access to safe and sustainable drinking water	☐	☐	☐	☐	☒	☒

B.3. Project/programme description (max. 2500 words, approximately 5 pages)

75. This project forges partnerships between federal and regional government stakeholders and communities for pioneering SWP in cooperation with local IUAs and small businesses in establishing and utilizing solar water pumping for drinking water and irrigation. The project pioneers financing and implementation arrangements that are self-sustainable and replicable, thereby accelerating the GoE's objective for universal access to safe water as well as increasing agricultural productivity. The two intervention areas, the Kobo Girana Valley in the Amhara region and the Borena zone in the Oromia region, were selected based on their high climate vulnerability and significant groundwater potential.
76. An important consideration for supporting the Northern Amhara region is the destruction of local infrastructure as a result of the conflict that took place in 2021.The government has commenced reconstruction activities of infrastructures destructed during the conflict with own resources as well as support from international development partners such the World Bank. The GCF support can inspire humanitarian reconstruction efforts to harness the opportunity to rebuild in a climate-resilient approach that strengthens vulnerable rural communities and contributes to providing access to existential goods such as food and water. As diesel generators still represent the BAU technologies for water pumping, the GCF intervention can develop a lighthouse effect by rebuilding infrastructure more sustainably with SWP. Furthermore, the following considerations were made for the selection of Kobo Girana Valley.

    - **Climate Vulnerability:** This area is particularly susceptible to climate change impacts, with erratic rainfall patterns and increasing temperatures affecting agricultural productivity and water availability.
    - **Groundwater Potential:** The Kobo Girana Valley has abundant but largely untapped groundwater resources. Previous irrigation development projects, such as the Kobo-Girana Valley Development Programme (KGVDP), have provided geohydrological data and groundwater reserve estimates, making this area ideal for the project.
    - **Population Density**: The valley is densely inhabited, with an estimated population of about 1.6 million over approximately 3,500 km², increasing the potential impact and benefit of the project.
    - **Existing Infrastructure:** There are 60 boreholes in the region that have been capped and are currently not in use. The project aims to rehabilitate these boreholes for irrigation purposes, providing significant benefits to approximately 4,500 smallholder farmers.
77. The second intervention area is the southern rangelands in Oromia region's Borena zone where livestock is the predominant source of food and income for the agro-pastoral population. In this target zone, the project area comprises four arid to semi-arid, drought prone and food insecure districts (or "woredas"), namely Yabello, Dire, Dilo, and Teltele.[39] In total, the area spans 19,285 km² and hosts an estimated 503,373

[39] Ministry of Water and Energy (MOWE) (2017): Groundwater resources evaluation and assessment project of Borena area: Volume V: hydrogeology & groundwater modeling annex i: main report; hydrogeology, Addis Ababa

inhabitants as well as a livestock population of approximately 1,469,900 (Annex 2). On average, the modelling results for the hydrogeological system, consisting of the four sub-basins: Laga Balal, Ririba, Magado and Taltale, estimate the total available water recharge at about 187.5 mcm/year. Furthermore, the following considerations were made for the selection of Borena as the project intervention site.

- **Climate Vulnerability**: This region, primarily inhabited by agro-pastoral communities, faces frequent droughts and water scarcity, making it one of the most climate-vulnerable areas in Ethiopia.
- **Groundwater Potential:** Although there is limited robust data on static groundwater supply due to the highly fractured nature of sub-surface water basins, sensitivity analyses indicate a high recharge potential. The hydrogeological system of the region, with its basaltic aquifers, supports sustainable groundwater extraction.
- **Livestock Dependency:** The Borena zone is predominantly dependent on livestock, and the project will allocate extracted water for drinking, livestock, and irrigation of fodder, directly benefiting approximately 66,540 households.
- **Existing Infrastructure:** The region has 40 boreholes that will be rehabilitated and powered by solar energy to support both potable water supply and agricultural needs.

78. **Ensuring sustainable abstraction of ground water resources**: Given previous (diesel-pump centered) irrigation development as part of the Kobo-Girana Valley Development Programme (KGVDP) [40], geohydrological data is available and groundwater reserves are estimated at about 2,548.74 mcm, static estimate, which are expected to remain the same after 20 years, the life of this project."(Annex 2, water balance study section). Similarly, to the Borena zone, total abstraction through project-induced well rehabilitation will not tap into reserves of the ground water aquifer system but only extract water from surface water recharge. Especially given shifting precipitation patterns and higher evaporation gradients, the recharge rate of sub-basins will however need continuous monitoring to ensure the sustainable recharge of the groundwater supply. The exact levels of abstraction will be captured through precise metering, a safeguard system that will be put in place to prevent unsustainable abstraction level. Salinity tests to determine ground water salinity will be conducted at both intervention areas when the boreholes are developed.

79. Due to highly fractured form of sub-surface water basins in Borena, no robust estimates or data exist on static groundwater supply. However, sensitivity analyses in the feasibility study estimate that, given the depth of basaltic aquifers in this hydrogeological zone, ground water extracted through this project will not tap into reserve of the ground water aquifer system but only extract water from surface water recharge. With solar radiation of >7.39 Kw/day in December, the target area is estimated to have a particularly high potential to use SWP. Existing deep wellfields include the Galchet-Sarite water supply project and the Borena Network Water Supply Project.

80. Groundwater balance studies annexed under 4 in the feasibility study (Annex 2) provides a detailed synthesis of the recharge potential of groundwater that hinges on various factors. These include encompassing precipitation volume, variability, surface water run-off, and the transmissivity of sediments, which, in turn, relates to rock types. Geological and hydrogeological conditions of the target area have been put into consideration when planning groundwater development initiatives. This understanding feeds into the estimation of groundwater recharge potential.

81. Accordingly, the Darcy Approach is employed in hydrogeological areas where sufficient data exists, such as in the Kobo Girana Valley. Considering the groundwater availability within the reserve, as well as the

[40] For a historical overview and critical account see Gebreyes, Million; Müller-Mahn, Detlef (2019): Cultural Political Economy of Irrigation Management in Northeastern Ethiopia: The Case of the Kobo-Girana Valley Development Programme, in: Water Alternatives, 12, p. 836-852

recharge and the quantity discharged for irrigation purposes, the following assumptions have been applied:

a. The radius of influence and well interference is nil as the distance between the 60 boreholes considered for this project and the additional 176 boreholes is beyond 500 meters.
b. Annual groundwater abstraction has been assumed 50 liters per second for all 60 wells (0.26 MCM per well) when extracted for 8 hours pumping rate per day and a period of six months/annum.
c. Considering a total number of 60 wells in the Kobo Girana valley targeted for this purpose, a total of 15.6 MCM of ground water will be extracted per annum from a total recharge of amount of 84.24 MCM
d. Thus at the current rate, also considering the amount extracted by the community, which is 8.4 MCM/annum in addition to 15.6 MCM/annum for the irrigation system, a total amount of 24 MCM of ground water will be extracted per annum leaving a net discharge of 60.24 MCM to the surface.
e. Considering a 2.5% population increase, linear extrapolation of the water demand of the community will increase to 14 MCM/annum in 20 years. While this approach does not take into consideration increased water demand as a result of improved livelihood and income, based on this approach, the total amount of groundwater extracted will increase to 39.4 MCM/annum, still leaving a net amount of 44.84 MCM as a runoff to the surface.
f. The water balance study based on baseline scenarios and putting the implementation of this project into **consideration thus estimates that a net 48.84 MCM will be available as a run-off without tapping to the existing groundwater reserve of 2,548.74 MCM, which will remain the same after 20 years, the life of this project.**

82. Conversely, for the Borena region with limited data availability, the Direct Precipitation Recharge Method is utilized. This method relies on surface water data, including rainfall infiltration and runoff from adjacent hilly regions, to calculate groundwater recharge, particularly along regional fault or fracture systems. Based on the availability of the groundwater from the reserve and the recharge and the amount that is discharged to the surface and extracted for irrigation purposes, the following assumptions have been applied;

a. The radius of influence and well interference is nil as the distance between the 40 boreholes considered for this project as well as existing 176 boreholes is beyond 500 meters.
b. Annual groundwater abstraction has been assumed at an average 20 liters per second for all 40 wells (0.10 MCM per well) when extracted for 8 hours pumping rate per day and a period of six months/annum.
c. Considering a total number of 40 wells in the Borena basin targeted for this purpose, a total of 4.15 MCM of ground water will be extracted per annum from a total recharge of amount of 524 MCM/annum. This will leave a net recharge of 519.85 MCM/Year.
d. Note that the Borena basin is a basaltic Aquifer, which is intensely fractured, resulting in strong connectivity within the hydrogeologic system. Thus, as opposed to ground water being reserved in the Kobo Girana valley within the water from surface water recharge, in Borena it flows within the fractures and it is very difficult to estimate the ground water reserve.
e. However, the amount of groundwater extracted from this project is 4.15 MCM or 0.8 percent of the recharge amount. **This explicitly shows that this project will only be using water from the superficial recharge and not tap into reserve of the ground water aquifer system.** Thus, the amount of ground water that will be extracted from this project is thus only 0.8 percent of the recharge value.

83. The project provides financing and technical assistance to overcome key market barriers described in section B2 (shortage of forex, access to finance by local communities, institutional and technical capacity and expertise) and increase smallholder farmer productivity. GCF funding will be channeled by MOF as the Accredited Entity (AE), to the regional and local entities. MoIL will define the technical requirements, ensure alignment with Climate Resilient and Green Economy (CRGE) sectoral policies and 10YDP/NDC targets, regional irrigation and water bureaus, and other stakeholders.

84. The CRGE Facility/Ministry of Finance as the Direct Access Entity manages a number of GCF and Adaptation Fund projects. One of the main learnings from the first rounds of projects implemented by the Ministry of Finance is the need to create a hub for learning and knowledge management between projects and within a project. This hub will provide support to the MoIL Programme Coordination team with regards to its knowledge management functions.

85. The project transforms previous plans for developing the ground water wells with submersible pumps and diesel generators by redirecting the focus on SWP. This project proposal thus redesigns plans to develop existing deep wellfields in the Kobo-Girana Valley and the Borena with solar PV to make them productive

and resilient for potable, agricultural and livestock watering purposes, in a community-centered approach that combines traditional value systems, gender and climate change considerations.

B 3.1: Complementary Program Components

Description of Components, Outputs and Activities

86. The program is designed in two components, Component 1 centers on direct interventions and infrastructure development, while Component 2 furnishes the requisite enabling environment, policy support, and capacity building to sustain and expand these interventions. Collectively, these two components craft a robust strategy to attain climate resilience and sustainable development objectives in the targeted regions.

87. Component 2, with its emphasis on enhancing the policy and regulatory framework, cultivates a conducive environment for the deployment of Solar Water Pumping (SWP) systems and governance structures delineated in Component 1. The digital Monitoring, Reporting, and Verification (MRV) and payment systems initiated under Component 2 will be indispensable for tracking the performance and impact of the infrastructures and practices put forth in Component 1. By implementing capacity development initiatives, Component 2 will also ensure that the technical and managerial skills needed for maintaining and operating the Component 1 infrastructure are locally available and that knowledge-sharing activities communicate best practices and lessons learned from Component 1's implementation, encouraging wider adoption and scaling. Investing in financial products and business models under Component 2 will provide the financial mechanisms necessary to guarantee the sustainability and scalability of initiatives under Component 1, thereby securing long-term impact.

88. Both components underscore the significance of gender inclusion and community participation. Component 1 guarantees direct benefits to women and community members through active involvement and decision-making across varied initiatives, and Component 2 integrates these considerations into policy and regulatory frameworks as well as financial and business models.

Component 1: Community Resilience

89. This component focuses on enhancing water access and agricultural productivity in drought-prone areas through the implementation of solar water pumping (SWP) systems. It aims to install a minimum of 100 solar-powered submersible pumps in the Kobo-Girana Valley and the Borena Zone, addressing the critical need for potable water and irrigation. The project includes the rehabilitation of existing wells, installation of new water infrastructure, and testing water quality to ensure safe drinking water. This initiative will directly benefit approximately 66,000 rural households, improving their access to clean water and supporting the irrigation needs of around 4,500 smallholder farmers. In addition to infrastructure development, Component 1 also focuses on establishing and training Irrigation User Associations (IUAs) to manage and maintain the SWP systems. This community-driven approach ensures local ownership and sustainability of the water supply systems. The project emphasizes gender inclusion by actively involving women, particularly female-headed households (FHHs), in the management and decision-making processes. The provision of technical and managerial training to the ISPsl further enhances the capacity to operate and maintain the installed infrastructure, ensuring long-term resilience and sustainability. IUAs/communities will be capacitated to hire ISP and oversee their work.

90. The component also introduces smart water metering systems to monitor and manage water usage efficiently. These systems help prevent overuse and ensure sustainable groundwater extraction, critical in arid regions facing water scarcity. The project includes developing fair and sustainable water tariffs, ensuring that the water supply services are economically viable and accessible to all community members. The comprehensive approach of Component 1 not only addresses immediate water needs but also builds a foundation for improved agricultural productivity, food security, and overall community resilience to climate change.

Output 1.1: Solar Water Pumps Installed

91. The installation of solar water pumps (SWP) aims to enhance water accessibility in drought-prone regions of Ethiopia, focusing on sustainable and renewable energy solutions. This output includes rehabilitating existing wells and ensuring they meet safety standards for potable use. The project prioritizes the installation of high-quality solar PV systems and submersible pumps, which will provide reliable water supply for both domestic and agricultural purposes. The integration of these systems will significantly reduce the community's dependence on traditional, less sustainable energy sources, contributing to environmental conservation and climate resilience. Additionally, the project includes community

awareness programs to educate residents on water quality standards and the importance of maintaining these systems, fostering a sense of ownership and responsibility.

92. This output is crucial for improving the quality of life in the target communities by providing consistent access to clean water. The reliable water supply supports domestic needs, agricultural activities, and livestock care, thus enhancing food security and livelihoods. The use of solar energy also aligns with global efforts to reduce greenhouse gas emissions, positioning the project as a model for sustainable development in similar regions. To realize this output, the following activities shall be implemented.

93. In Kobo Girana, the focus is on making 60 previously capped boreholes productive, primarily for irrigation purposes, supporting crop cultivation and horticulture. This initiative aims to benefit approximately 4,700 smallholder farmers, including about 4,500 in Kobo Girana and over 200 in Borena. In Borena, the project targets 40 boreholes to be powered by solar energy, with the extracted water allocated for drinking (30%), livestock (40%), and irrigation (30%) for growing fodder. This distribution is expected to benefit around 66,540 households. A detailed quantification of the beneficiaries can be found in Annex 22: Adaptation Beneficiaries, based on the guidance in the GCF Results Handbook. The selection of the Boreholes will be conducted as per the selection protocol and criteria provided in the feasibility study. Project direct beneficiaries will be selected based on a mutually agreed selection criteria. The selection criteria shall be developed with active participation of the project stakeholders including community representatives.

Activity 1.1.1: Rehabilitation of Wells and Testing of Water Quality *(Executing Entity-MOWE)*

94. This activity will begin with a comprehensive assessment and rehabilitation of existing wells in the target communities. The process involves inspecting and repairing any damages to ensure they are safe and functional for long-term use. The rehabilitation will include the installation of new well liners, cleaning of debris, and ensuring that the wells are adequately sealed to prevent contamination. Following the structural rehabilitation, rigorous water quality testing will be conducted to ensure that the water meets safety standards for drinking and irrigation. This will involve chemical, microbiological, and physical analyses to detect any contaminants and assess the water's suitability for various uses. The findings from these tests will inform further treatment processes if necessary and establish baseline data for ongoing monitoring.

95. In addition to physical repairs and testing, community awareness programs will be launched to educate local populations on the importance of water quality and the steps being taken to ensure safe access. This activity is critical in building trust within the community and ensuring that the rehabilitated wells are used correctly and maintained. Furthermore, the project will establish protocols for regular monitoring and testing of water quality, ensuring that the community continues to have access to safe water throughout the project's lifespan and beyond.

96. Table 2 provides an overview of borehole characteristics by region. The project sites are strategically located in carefully selected vulnerable agricultural areas with existing deep boreholes (see Annex 2 for full list of wells and technical parameters as well as Annex 16 for maps).

Table 2: Overview of borehole site rehabilitation by target region.

Project target region	Number of rehabilitated sites (minimum)	Average discharge (l/s)	Average pump size (kw)	Types of direct beneficiaries	Main purpose	Lead EE
Kobo Girana Valley (Amhara)	60	50.08	79.8	Smallholder farmers (up to 1ha of land ownership)	Crop irrigation	MoIL
Borena Zone (Oromia)	40	16.72	37	Pastoralist communities, smallholder farmers, households	Livestock watering, fodder and potable water	MoIL

Sub activities:

- Conduct a comprehensive assessment of existing wells and water sources.

- Perform necessary repairs and cleaning of wells.
- Install or replace well casings, pumps, or other components
- Collect and analyze water samples for quality testing.

Deliverables:

- Protocols for site-specific borehole retesting
- Guidelines for borehole flushing and cleaning procedures
- Template for recording and updating borehole data

Activity 1.1.2: Procurement and Installation of Solar PV Systems, Submersible Pumps, and Irrigation Systems (Executing Entity- MOWE and MOIL)

97. Specialized firms will be engaged to prepare the sites and install the equipment in a phased manner. To ensure the project's sustainability, maintenance contracts will be tendered to regional firms, supported by a user fee system for commercial use and phased-in tariffs for community use, incorporating a gender-responsive business model. The project also aims to upscale successful governance practices from the Kobo Girana region, particularly by establishing Irrigation Users Associations (IUAs) in the Borena zone. These associations are crucial for enhancing agricultural resilience and productivity. The use of smart meters will facilitate digital accounting of key impact indicators, in line with the GCF Results Handbook guidelines for quantifying adaptation beneficiaries. This comprehensive strategy integrates technical implementation with governance structures and monitoring systems, ensuring the project's long-term success and scalability.
98. The procurement phase emphasizes acquiring high-quality solar photovoltaic (PV) systems and submersible pumps, specifically chosen for their energy efficiency, durability, and suitability to local climatic conditions. Once acquired, these systems will be transported and installed, with solar panels strategically positioned to maximize sunlight capture. The PV systems will be connected to the pumps and integrated with the existing water infrastructure. This process will be overseen by various agencies, ensuring that each step, from procurement to installation, is carried out to the highest standards. The collaboration of these agencies is critical to the successful implementation and sustainability of the project, highlighting the importance of coordinated efforts in achieving the project's objectives.
99. The installation will not only provide immediate access to water but also reduce dependence on traditional, less sustainable energy sources. This shift to solar power is crucial for promoting environmental sustainability and reducing greenhouse gas emissions. Additionally, the project will include the installation of irrigation systems connected to the solar pumps, enabling the efficient distribution of water for agricultural purposes. This component will help smallholder farmers manage water resources more effectively, improving crop yields and livelihoods. Training programs will be conducted for local technicians and community members on the operation and maintenance of these systems, ensuring their long-term functionality and sustainability.
100. The Ministry of Water and Energy (MOWE) and the Ministry of Irrigation and Lowlands (MOIL) are expected to play pivotal roles in the successful implementation and sustainability of these activities. MOWE will primarily be responsible for overseeing the technical aspects of the project, including the procurement and installation of solar photovoltaic (PV) systems, submersible pumps, and other related infrastructure. This involves setting technical standards for equipment to ensure energy efficiency and durability, suitable for the local climatic conditions. MOWE will also lead the training programs for local technicians, ensuring they are equipped with the necessary skills for the operation and maintenance (O&M) of the newly installed systems. Additionally, MOWE will work closely with contractors during the site preparation and equipment installation phases, providing technical oversight and ensuring compliance with the project’s specifications.
101. MOIL will be responsible for irrigation infrastructure installation and facilitating the establishment and functioning of Irrigation Users Associations (IUAs) in the Borena zone, drawing on successful governance practices from the Kobo Girana region. This includes drafting and enforcing bylaws for water use, setting up management frameworks for the IUAs, and ensuring equitable water distribution among different user groups, including for drinking, livestock, and irrigation.
102. Together, MOIL and MOWE will play a crucial role in monitoring the implementation of the project, including the use of smart meters for water accounting and reporting. They will ensure that the governance structures are inclusive, particularly promoting gender-responsive approaches and supporting the economic participation of women in water-related activities. They will ensure the project's alignment with national policies and standards, fostering an enabling environment for sustainable water resource management and agricultural development in the targeted regions.

Sub activities:

- Assess site conditions and prepare optimal system design and components.
- Conduct a competitive bidding process and select qualified suppliers.
- Transport and deliver solar PV systems, submersible pumps, and irrigation equipment to the site.
- Install and configure the solar PV systems, including panels, inverters, pumps, riser pipes and electrical components.

Deliverables

- Installed solar PV systems and submersible pumps.
- Training completion certificates for local technicians

Activity 1.1.3: Operations and Maintenance of Solar Water Pump and Water Supply Infrastructure *(Executing Entity- MOWE)*

103. Sustainable operation and maintenance (O&M) of the solar water pumps and associated infrastructure are vital for the project's success. This activity will involve setting up a robust O&M framework that includes regular inspections, preventive maintenance, and prompt repairs. The project will train local technicians in essential O&M skills, such as troubleshooting common issues, performing regular check-ups, and replacing worn-out parts. This local capacity building ensures that the community is self-sufficient and can manage the systems independently after the project's completion.

104. To support these efforts, an O&M manual will be developed and distributed among the communities. This manual will include detailed guidelines on daily operations, maintenance schedules, and safety protocols. Additionally, the project will establish a local support network, possibly involving partnerships with nearby technical institutions or private sector companies, to provide technical assistance and spare parts. This network will help in addressing more complex issues that the local technicians might not be equipped to handle. Regular workshops and refresher courses will be organized to update the technicians on new technologies and best practices, ensuring that the water supply systems remain efficient and reliable. The IUAs and WUAs will be empowered through targeted training programs, enabling them to manage the daily operations, conduct routine maintenance, and address any technical issues that may arise with the solar water pumps and associated infrastructure. They will benefit significantly from the O&M activity by gaining a clear framework for managing the water resources sustainably. They will be equipped with the knowledge and skills to perform essential maintenance tasks, such as inspecting and cleaning the systems, troubleshooting common issues, and coordinating repairs when necessary. Additionally, the associations will implement monitoring protocols using smart meters to track water usage, ensuring efficient water distribution and minimizing wastage. The user fee system, coupled with phased-in tariffs for community use, will also be managed by these associations, providing a sustainable financial model to cover the costs of O&M. This approach not only ensures the infrastructure's longevity but also fosters a sense of ownership and accountability among the community members, strengthening their capacity to manage their resources independently.

Sub Activities

- Develop and implement a comprehensive operations and maintenance plan.
- Conduct regular inspections and monitoring of the SWP and water supply infrastructure.
- Provide training and capacity building for local personnel on operations and maintenance procedures.
- Establish a system for recording and addressing any issues or repairs needed

Deliverables:

- O&M manual.
- Regular maintenance logs.
- Technical support network contacts

Output 1.2: Efficient Water Distribution System Constructed for Households, Irrigation, and Livestock Use

105. The efficient water distribution system encompasses the construction of distribution pipelines, storage tanks, and irrigation infrastructure, ensuring equitable access to water resources across the community. This infrastructure is designed to optimize water distribution for households, irrigation fields, and livestock, considering local topography and water demand patterns. The installation of smart water meters at various distribution points allows for precise monitoring of water usage, facilitating effective management and conservation of water resources. This output also includes the development of a fair and sustainable payment tariff system, ensuring the financial viability of the water supply infrastructure. The project engages the community in designing this system, considering factors like household income and water

usage patterns. By implementing a pilot phase and gathering feedback, the project ensures the payment system is both fair and practical, providing subsidies where necessary to support low-income households.

106. The construction of this distribution system significantly improves water access and management in the community. It supports agricultural productivity by providing reliable irrigation, which is essential for crop cultivation and livestock management. The system also promotes efficient water use and conservation, reducing wastage and ensuring that water resources are utilized sustainably. This output is vital for enhancing community resilience to water scarcity and supporting overall socio-economic development. This will result in 20.8 km of mains, 66.7 km of sub-mains, 52 water points, 42 cattle troughs.

107. The project will provide SWP irrigation and potable water infrastructure for the direct beneficiaries located in the vicinity of the wells through irrigation service providers (or ISPs)[41] in the project target kebeles. The ISPs will have a role in the operations and maintenance of the irrigation and water infrastructures. The role of IUAs as cooperative structures is explained in section B.4. These service providers shall be hired by the MOIL in close collaboration with the regional bureau of Irrigation and Lowlands and IUAs. The contracting and engagement of these service providers will strictly follow the process and practices laid out in the procurement directive of the country. The project shall provide financing to the ISPs through Rural Saving and Credit Cooperatives (RUSACCOs) in the form of repayable grant through a revolving fund scheme.

108. RUSACCOs are a form of cooperative financial institutions designed to provide financial services to rural communities, particularly those underserved by traditional banking systems and for the primary purpose of providing savings and credit services to rural members, facilitating access to financial resources for agricultural and small-scale business activities. They are recognized and regulated under Ethiopian cooperative laws (Proclamation No 985/ 2016) and operate on democratic principles where each member has one vote, regardless of the amount of their financial contribution. The IUAs/WUAs shall regularly monitor and supervise the services of the ISPs in their localities and ensure that the later operates as per the established agreements and operational principles.

Activity 1.2.1: Construction of Pipe Network, Irrigation Infrastructure, and Point Collection *(MOWE and MOIL)*

109. The construction of an efficient water distribution system will be a critical component of the project, aimed at delivering water to households, irrigation fields, and livestock points. This activity will involve the detailed planning and laying of pipelines to connect water sources with various distribution points. The design will consider factors such as terrain, water demand, and accessibiity to ensure optimal coverage and minimal water loss. Construction will include the establishment of main and secondary pipelines, storage tanks, and distribution points strategically located to serve the needs of different user groups within the community.

110. This infrastructure will not only facilitate the equitable distribution of water but also support the adoption of more efficient irrigation practices. By providing reliable access to water, the project will enable farmers to plan their agricultural activities better, potentially shifting to more water-intensive crops or increasing the frequency of planting cycles. This, in turn, will enhance food security and income levels. Moreover, dedicated livestock watering points will be established to support local pastoralist communities, helping to prevent overgrazing and land degradation. The project will also include community consultations and training on the use of the new infrastructure, ensuring that users understand how to operate and maintain the systems effectively. It will ensure, the provision of at least 25 l/day/capita as the safe minimum water required for rural families, in line with GoE goals. Mention, the focus in Amhara region i.e. irrigation vs, Oromia, livestock, and drinking water. Also quantify results,

Sub activities

- Conduct a detailed site survey to plan the pipe network and irrigation infrastructure layout.
- Procure and transport necessary materials, such as pipes, fittings, valves, control systems, and construction equipment.
- Excavate and prepare the trenches for laying the pipe network and irrigation pipelines.
- Install and connect the pipe networks and pipelines with pumps, control systems, reservoirs for efficient water distribution.
- Test and commission the installed irrigation infrastructure and pipe networks for proper operation.

Deliverables:

- Detailed infrastructure design plans.

[41] „Vicinity“ depends on local circumstances such as locally viable irrigation infrastructure and population density. It is estimated that most drip irrigation will take place within 1-3 kilometers of the water extraction site.

- Operational irrigation and livestock watering systems.
- Community training sessions and materials

Activity 1.2.2: Install Smart Water Meters to Monitor Usage *(MOWE)*

111. To ensure the efficient use and management of water resources, smart water meters will be installed at various points within the distribution network. These meters will provide real-time data on water usage, allowing for accurate monitoring and management of the supply. The data collected will help identify patterns of use, detect leaks or wastage, and inform decisions on water conservation measures. This information will be crucial for managing water resources sustainably, especially in drought-prone regions where water scarcity is a significant concern. The smart meters will be integrated into a digital monitoring system accessible to community leaders and project managers. This system will provide alerts in case of unusual activity, such as sudden spikes in usage, which could indicate leaks or unauthorized access. The community will be trained on how to interpret and use the data provided by the meters, fostering a sense of responsibility and ownership over the water resources. Additionally, the project will explore the potential for using the data to implement tiered pricing structures, encouraging users to conserve water and reducing the financial burden on low-income households. In Borena, a total of 40 boreholes have been targeted by this project to be powered by solar energy. the extracted water will be allocated as follows: 30% for drinking, 40% for livestock, and 30% for irrigation, specifically for growing fodder. Please mention the use of water flow to decide on the use of water. Earlier versions mention those details >10liters/sec, 4-10 liters/sec and <4 liters/sec.

Sub activities

- Procure and transport the required smart water meters and associated equipment.
- Install the smart water meters at the identified locations, ensuring proper connectivity and data transmission.
- Configure and integrate the water meters with a centralized monitoring and data management system.
- Provide training to relevant personnel on the operation and maintenance of the smart water meters.

Deliverables:

- Installed smart water meters.
- Monitoring system setup.
- Community training reports

Activity 1.2.3: Design and Refine Payment Tariff for Community Water Supply Payments *(MOWE and MOIL)*

112. Establishing a fair and sustainable payment system for water supply services is essential for the project's long-term viability. This activity will involve designing and refining a tariff structure that balances affordability for users with the costs of maintaining and operating the water infrastructure. The tariff system will be developed through consultations with community members, local leaders, and other stakeholders to ensure it is equitable and transparent. Factors such as household income levels, water usage patterns, and the cost of system maintenance will be considered in setting the tariffs. Once the tariff structure is established, the project will implement a pilot phase to test its effectiveness and gather feedback from users. Adjustments will be made as necessary to address any issues that arise, such as difficulty in payment or concerns about fairness. The project will also explore options for providing subsidies or discounts to vulnerable groups, such as low-income families or those with special needs. An essential part of this activity will be educating the community about the payment system, including how the funds collected will be used to support the O&M of the water infrastructure. Transparent communication will help build trust and encourage compliance with the payment system. Water pricing is new in rural Ethiopia, and the evidence and experience generated by the GCF-supported interventions will be central to further strengthening tariff-setting as a key pillar of replicating and upscaling SWP-based irrigation. MoIL is currently overhauling the regulatory framework for irrigation as part of developing the National Irrigation Programme, with support from AfDB. Tariff-setting will be led by MoIL, based on the regional water laws of Amhara and Oromia, which enable flexible tariff-setting by community-led organizations such as IUAs, representing the end-user beneficiaries. The proposed tariff levels have been calculated in the financial model with the objective to design cost-reflective tariffs that fully take into account all relevant costs, especially for operations and maintenance. Final tariff levels will be agreed between MoIL, regional water bureaus and IUAs based on actual costs of the intervention.

Sub activities

- Conduct a community-wide assessment of affordable but cost reflective rates for water supply services.
- Analyze the costs associated with operating and maintaining the water supply infrastructure.
- Develop a fair and sustainable pricing structure for water usage.
- Consult with community representatives and stakeholders to refine the proposed tariff.
- Implement and communicate the finalized payment tariff to the community

Deliverables:

- Tariff structure documentation.
- Pilot phase evaluation report.
- Community outreach materials

Activity 1.2.4: Operation and Maintenance Manual of Water Supply Infrastructure *(MOIL)*

113. To support the sustainable operation of the water supply infrastructure, a comprehensive operation and maintenance (O&M) manual will be developed. This manual will serve as a practical guide for ISPs that are involved in the management of the water systems. It will cover essential topics such as daily operational procedures, routine maintenance schedules, and troubleshooting common issues. In addition to providing detailed instructions, the manual will emphasize the importance of preventive maintenance, highlighting tasks that should be performed regularly to prevent system failures. This proactive approach will help extend the lifespan of the infrastructure and reduce the need for costly repairs.

Sub activities

- Develop and implement a comprehensive operations and maintenance plan for the water supply infrastructure.
- Conduct regular inspections and monitoring of the SWP and water supply infrastructure 1.2.5.3: Provide training and capacity building for local personnel on operations and maintenance procedures.
- Establish a system for recording and addressing any issues or repairs needed in a timely manner

Deliverables:

- O&M manual.
- Training session reports.
- Distribution list and follow-up support contacts

Output 1.3: Gender-Sensitive Irrigation User Associations (IUAs)/Water Use Associations (WUAs) Established and Capacitated

114. The establishment of gender-sensitive IUAs/WUAs is a key component of the project, aimed at promoting inclusive governance of water resources. These associations are structured to ensure equal representation and participation of all community members, particularly focusing on increasing the involvement of women. By drafting and approving by-laws that mandate minimum participation levels for women, the project institutionalizes gender inclusivity, fostering a more equitable decision-making process.
115. To support the functionality of these associations, the project provides comprehensive training programs covering governance, financial management, and technical aspects of water resource management. These programs will be designed to empower members with the necessary skills and knowledge to manage water resources effectively. Special emphasis will be placed on building the capacity of women, enabling them to take on leadership roles within the associations and contribute meaningfully to the decision-making process.
116. The IUAs/WUAs play a critical role in the sustainable management of water resources, ensuring that water use is regulated and conflicts are minimized. By involving a diverse group of stakeholders, including women and marginalized groups, these associations ensure that the needs and perspectives of all community members are considered. This output enhances community cohesion and supports the equitable and sustainable use of water resources, contributing to overall community resilience. Under this output, the following activities will be implemented.
117. Learning from and following similar models from the KGRVD, Agricultural Commercialization Clusters (ACC), a CRGE Facility fast track project and national/international best practices, beneficiaries (e.g., cooperatives) will be leveraged to manage the infrastructure through appropriate technical assistance (e.g., training). Farmer beneficiaries will also be assisted by agriculture extension workers assigned through the Ministry of Agriculture, on improving farming methods and techniques to increase farmer productivity through irrigation. This will include regular training programs on modern irrigation techniques, best practices, technologies, fertilizer application, crop selection, field demonstration amongst others.

The extension service workers will also closely engage with the IUA and the service providers to understand their needs and provide tailored solutions. Complementary instruments such as offering farmers and business climate risk insurance products that will further enhance the resilience of their agricultural productivity will also be explored. The project design foresees such products provided through community-oriented, regionally based financing institutions, e.g., with the aim of providing access to finance for additional on-farm equipment. The project direct beneficiaries will be members of the IUAs and the selection will be based on a mutually agreed selection criteria. The selection criteria shall be developed with active participation of the project stakeholders including community representatives. The membership criteria will be further elaborated in the bylaws.

Activity 1.3.1: Facilitate the Formation of IUAs/WUAs with a Focus on Gender Inclusivity *(MOIL)*

118. This activity will focus on establishing Irrigation User Associations (IUAs) and Water Use Associations (WUAs) in the target communities, with a strong emphasis on gender inclusivity. The formation of these associations is crucial for the local governance of water resources, ensuring that water use is managed sustainably and equitably. Refer section B.4 for detailed explanation of IUAs as cooperative structures. The project will work closely with community leaders and local organizations to identify potential members, with particular attention to including women and other marginalized groups. Efforts will be made to create a diverse and representative membership that reflects the community's demographics and water use needs. To promote gender inclusivity, the project will implement targeted outreach and awareness campaigns to encourage the participation of women in the IUAs/WUAs. This will include highlighting the benefits of women's involvement in decision-making processes and addressing any cultural or social barriers that may hinder their participation. Additionally, the project will provide training and capacity-building opportunities specifically designed for women, empowering them to take on leadership roles within the associations. By fostering an inclusive environment, the project aims to ensure that the perspectives and needs of all community members are considered in water management decisions.

Sub activities

- Conduct community mobilization and awareness campaigns to promote the importance of gender inclusivity in water management.
- Identify and engage with local women's groups, community leaders, and other stakeholders to ensure broad representation.
- Facilitate the election or nomination process for IUA/WUA members, ensuring equal opportunities for women's participation.
- Establish clear roles and responsibilities within the IUAs/WUAs, promoting gender balance in leadership positions.
- Provide training and capacity building on gender mainstreaming and inclusive decision-making processes.

Deliverables:

- List of IUA/WUA members.
- Outreach campaign materials.
- Training completion certificates for women

Activity 1.3.2: Draft and Approve By-laws Mandating Minimum Participation Levels for Women (MOWE and MOIL)

119. To institutionalize gender inclusivity within the IUAs/WUAs, the project will support the drafting and approval of by-laws that mandate minimum participation levels for women. These by-laws will set clear guidelines and quotas to ensure that women are adequately represented in the associations' leadership and decision-making structures. The process of drafting the by-laws will be participatory, involving consultations with community members, local leaders, and gender experts to ensure that the rules are culturally sensitive and practically feasible. Once drafted, the by-laws will be reviewed and approved by the members of the IUAs/WUAs. The project will facilitate discussions and workshops to explain the importance of these rules and garner support from both men and women in the community. The by-laws will include provisions for regular monitoring and reporting on gender participation (minimum 35% at project start, aiming for 50% by project end) and leadership (at least 33% leadership positions for women) in IUAs, allowing for adjustments and improvements over time. Additionally, the project will establish mechanisms to ensure accountability and compliance with the by-laws, such as appointing gender focal points or committees within the associations. These measures will help create a more inclusive and

equitable governance structure, empowering women to contribute meaningfully to water management and community development.

Sub activities

- Review existing by-laws or governing documents of the IUAs/WUAs to identify opportunities for incorporating gender considerations.
- Consult with IUA/WUA members, community representatives, and gender experts to determine appropriate minimum participation levels for women.
- Draft by-law amendments or new by-laws that clearly outline the minimum participation requirements for women.
- Facilitate participatory discussions and consensus-building processes to approve the updated by-laws.
- Disseminate and implement the approved by-laws, ensuring compliance and monitoring of women's participation levels.

Deliverables:

- Approved by-laws.
- Workshop reports.
- Compliance monitoring reports

Activity 1.3.3: Develop and Implement Training Programs for IUA/WUA Members (MOWE and MOIL)

120. Comprehensive training programs will be developed and implemented to equip members of the IUAs/WUAs with the knowledge and skills necessary to effectively manage water resources. These programs will cover a wide range of topics, including governance and organizational management, financial management, technical aspects of water infrastructure, and sustainable water use practices. Special emphasis will be placed on gender-sensitive training, ensuring that both men and women are equipped to participate fully in the associations' activities.

121. The training programs will be delivered through workshops, seminars, and hands-on training sessions conducted by experts in relevant fields. These sessions will provide practical knowledge and skills, such as how to conduct meetings, manage finances, monitor water usage, and maintain infrastructure. To ensure the training is accessible to all members, the project will consider factors such as location, timing, and language. Additionally, follow-up support and mentoring will be provided to reinforce the training and address any challenges that may arise. By building the capacity of the IUAs/WUAs, the project aims to create strong, self-reliant organizations capable of managing water resources sustainably and inclusively.

Sub activities

- Conduct a needs assessment to identify the specific training requirements for IUA/WUA members, considering gender-specific needs.
- Design and develop comprehensive training modules covering topics such as water management, conflict resolution, financial management, and leadership skills.
- Ensure that training materials is translated into local languages and delivery methods are gender-sensitive and inclusive.
- Facilitate the delivery of training programs ensuring equal participation and engagement of both men and women.
- Conduct post-training evaluations and provide ongoing support and refresher training as needed.

Deliverables:

- Training program curriculum.
- Workshop attendance records.
- Follow-up support documentation

Activity 1.3.4: Provide Ongoing Operational Support and Technical Assistance to IUAs/WUAs *(MOWE and MOIL)*

122. In addition to initial training, the project will provide ongoing operational support and technical assistance to the IUAs/WUAs. This support will include regular visits by technical experts, who will assist with troubleshooting and problem-solving related to water management and infrastructure maintenance. The experts will also provide guidance on best practices and innovative solutions to enhance the efficiency and sustainability of water use. This continuous support will help the associations adapt to changing conditions and challenges, ensuring the long-term success of the project. The project will also establish a support network that includes local government agencies, non-governmental organizations, and private sector partners. This network will provide additional resources, such as access to technical expertise, funding opportunities, and capacity-building initiatives. Regular meetings and workshops will be organized to facilitate knowledge exchange and collaboration among the IUAs/WUAs and other

stakeholders. By fostering a strong support system, the project aims to empower the IUAs/WUAs to become independent, resilient organizations capable of managing water resources effectively and contributing to broader community development goals.

Sub activities

- Establish a dedicated support team or focal point to assist IUAs/WUAs with operational challenges and technical queries.
- Conduct regular monitoring and evaluation visits to assess the performance and needs of IUAs/WUAs.
- Facilitate knowledge-sharing and peer-learning opportunities among IUAs/WUAs, promoting the exchange of best practices.
- Provide specialized technical assistance and guidance on issues such as water resource management, infrastructure maintenance, and conflict resolution.
- Encourage and support the participation of women in decision-making processes and leadership roles within IUAs/WUAs

Deliverables:

- Support visit reports.
- List of network partners.
- Workshop materials and reports

Output 1.4: Small Scale Revolving Fund Facility Established

123. The establishment of a small-scale revolving fund facility aims to enhance financial inclusion and support community members in accessing fund for agriculture and ISPs for O&M costs. The project collaborates with Rural Savings and Credit Cooperatives (RUSACCOs) (please refer to the details on RUSACCOs in section B.4) to manage this facility, providing returnable grants for the purchase of improved and high yield crops, vegetable, and animal varieties and O&M costs for ISPs. RUSACCOs are a form of cooperative financial institutions designed to provide financial services to rural communities, particularly those underserved by traditional banking systems and for the primary purpose of providing savings and credit services to rural members, facilitating access to financial resources for agricultural and small-scale business activities. They are recognized and regulated under Ethiopian cooperative laws (Proclamation No 985/ 2016) and operate on democratic principles where each member has one vote, regardless of the amount of their financial contribution. To ensure the effective management of the fund, the project provides training to IUA/WUA members through the RUSACCOs on financial literacy and management skills. This training includes topics such as budgeting, saving, and responsible borrowing, with a focus on empowering women and marginalized groups. The project also establishes clear terms and conditions for the revolving fund, including repayment schedules and eligibility criteria, to promote transparency and accountability.

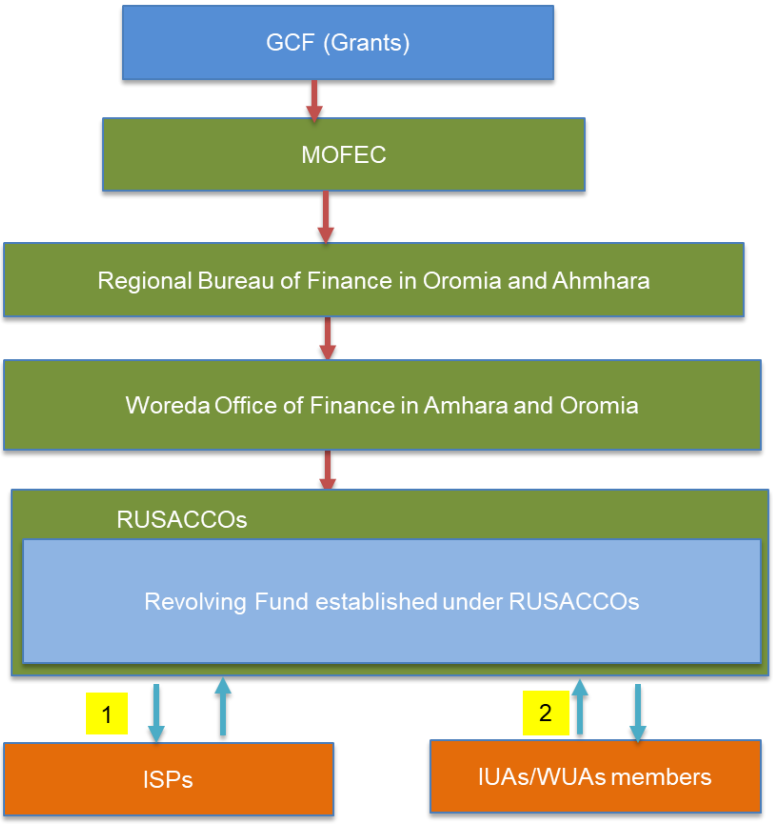
124. This output significantly enhances the economic resilience of the target communities by providing access to finance for productive investments. It enables community members to invest in agriculture and other activities that can contribute to improving their livelihoods and to food security. The fund also promotes a culture of financial management, which is crucial for long-term economic stability and growth. By supporting community-led financial initiatives, the project fosters a sense of ownership and responsibility, contributing to sustainable development.

125. To ensure that the funds will still be administered for their intended purposes after the GCF exits the project, several measures have been proposed. The Cooperative Promotion Desks situated in each Woreda (district) will play a key role in both supporting and regulating the RUSACCOs. These desks will assist in providing auditing, inspection, and supervisory roles once they are established. Additionally, RUSACCOs will open separate bank accounts to ensure proper management and accountability of the revolving fund. The IUAs/WUAs will also enforce and ensure implementation of the bylaws. The project will also put in place measures to ensure that the revolving fund will adapt to potential changes in market conditions, such as inflation or economic challenges, during project implementation or after. These measures include allocation of additional finance by the government and mobilization of finance from other development partners. These measures could allow the interest rates to be adjusted based on market conditions, ensuring sustainability and affordability for the beneficiaries.

126. Regarding the replenishment of the fund or attracting additional local financing sources, the project design includes developing a sustainable financial plan for the revolving fund, considering initial capitalization, operating costs, and potential revenue streams. There are also plans to establish mechanisms for monitoring and enforcing repayment, including provisions for late payments or defaults, which will help maintain the fund's continuity and sustainability. Furthermore, the project aims to leverage complementary instruments such as climate risk insurance products provided through community-

oriented, regionally based financing institutions. This will enhance the resilience of agricultural productivity and provide additional financial support to farmers.

127. The fund, which is allocated for revolving fund (USD 825,000) will be channeled to irrigation service providers and project direct beneficiaries by MOF through BOFEDs, WOFEDs and to RUSACCOs. The revolving fund scheme will have the following structure.



Key

1= Returnable grants to ISPs for O&M and to project direct beneficiaries for purchase of agricultural inputs and other services

2= Grant repayment by ISPs and beneficiaries

Depending on the project site, the following key locally relevant agricultural commodities will be supported prioritizing local value chains and food security.

Region	*Main agricultural produce*
Kobo Girana Valley	Cereal production (e.g., teff, wheat, barely), horticulture (e.g., tomato, onions, mungbeans, legumes) and agroforestry (e.g., avocado, mango, papaya)
Borena Zone	Livestock (dairy and meat, poultry, and fodder production)

Table 3: Typical agricultural commodities supported by region.

128. The project will ensure women in general and specifically FHHs benefit from the project activities. Cooperatives to be supported will need to ensure participation of women and FHHs both as members and executives. To sustain the participation of women beyond the project lifetime, the cooperatives' bylaws will be reviewed to include inclusive participation and leadership. Technical and leadership training will be provided to the cooperatives including all elected female officers. Project activity and M&E reports will include sex disaggregated data for follow up.

129. The financial sustainability of the interventions is ensured by designing cost-reflective water tariffs that fully consider operations and maintenance costs. In the base case of the sensitivity analysis of the financial model, the following tariffs are assumed (see financial model, sheet summary).

130. The water tariffs assumed in the base case generate revenues that can fully cover OPEX costs, which are estimated to be around 55-57% of expected revenues (see financial model, sheet calcs_cluster, line 104) on average throughout the lifetime of the project.

Activity 1.4.1: Establish and/or Strengthen linkage with Rural Savings and Credit Cooperatives (RUSACCOs) (MOIL)

131. The establishment and strengthening of linkage of IUAs/WUAs with the Rural Savings and Credit Cooperatives (RUSACCOs) is a key activity aimed at enhancing financial inclusion and access to finance for community members. IUAs and their individual members will form the RUSACCO through the support of the woreda Cooperative Promotion Desks. The desk's primary role is both supportive and regulatory. It assists in organizing and establishing RUSACCOs in areas where they don't exist, prepare the groupings for registration, promote the principles of Saving and Credit Cooperatives (SACCOs) in general, provide auditing, inspection and supervisory role once they are established. RUSACCOs in Ethiopia are the prime source of finance for rural communities particularly the vulnerable sections striving to get small loans to support their livelihoods and expedite productive services such as operationalization of rural potable and irrigation water schemes.

132. Once organized, the desk will grant the operation license (as well as approved by-laws) to enable the RUSACCOs administer the revolving fund. Members of IUAs and the ISPs will then have access to the funds through revolving fund arrangement. The by-laws that will dictate the purpose for fund disbursement – in this case – for agricultural input such as fertilizers, seeds, improved cattle breeds, amongst others will be enacted. A member of the IUA can access up to $350 as revolving fund. The by-laws can be amended from time to time through the meeting of the General Assembly of the RUSACCO (the General Assembly is comprised of the members of the RUSACCO). Fund disbursement will be guided by the fund Disbursement Manual of the RUSACCO to which the members agree to at its establishment. This manual can be modified as required from time to time.

133. The project will work with existing RUSACCOs to strengthen their capacity, as well as establish them in areas where they do not currently exist. This will involve training the management and staff of RUSACCOs in financial management, governance, and customer service to ensure they can effectively serve their members. The project will also work with RUSACCOs to develop criteria and procedures for revolving fund disbursement, ensuring that funds are used for their intended purposes and repaid on time. By enhancing the capacity of RUSACCOs, the project aims to create a sustainable financial system that supports community development and resilience.

134. Executing entities led by MoIL will convene a technical assistance programme to design appropriate financial products based on a revolving fund that will be co-created with local IUAs, RUSACCOs and regional bureaus of finance (Component 1.3). This programme will fully design and operationalize the revolving fund operated by RUSACCOs, which will provide revolving fund efficient on-farm irrigation equipment, including exact level of interest rates and repayment schedules. This component will also consider options for digital payments of revolving fund and water tariffs through E-Birr and/or comparable mobile money solutions. MoIL seeks to ensure that all federal and regional sector regulations (in particular, tariff-setting and health aspects of drinking water) are fully considered in the specifications of financial products in particular the revolving fund that RUSSARCO. Moreover, specific aspects of business models working with community-based farmer aggregators such as agricultural cooperatives and IUAs will be integrated. Business models will be gender-sensitive, e.g., considering local gender roles in agriculture and water use. Moreover, financing mechanisms and instruments will be designed to incentivize higher climate impacts (mitigation, adaptation) and SDG contributions. This can be achieved by designing a results-based water pricing scheme in which cost-reflective water tariffs will be quantity-based and not on e.g. by collecting uniform monthly fees which do not consider actual water usage. Smart meters allow a precise monitoring of water and electricity flows (see above). Crop-specific additional inputs on how to optionally use irrigation technology to conserve water use while maximizing yields will be provided by agricultural extensions service workers as part of the capacity building interventions.

Sub-activities

- Establish and/or strengthen RUSACCOs.
- Conduct a baseline assessment to identify existing RUSACCOs and their capacity needs.
- Facilitate the formation of new RUSACCOs in areas where they do not exist, ensuring inclusive membership and governance structures.
- Assist RUSACCOs in developing or updating their bylaws, policies, and operational procedures.
- Facilitate linkages between RUSACCOs and financial institutions.

Deliverables:

- Established or strengthened RUSACCOs.
- Training reports.
- Revolving fund disbursement procedure documentation

Activity 1.4.2: Provide Training to RUSACCO Members on Financial Literacy *(MOIL)*

135. Financial literacy training will be provided to members of RUSACCOs, who are also members of the IUAs/WUAs, to enhance their understanding of financial management and decision-making. This training will cover topics such as budgeting, saving, and investing, as well as the importance of maintaining good credit. The training will be designed to be accessible and relevant to the needs of the members, with practical examples and exercises that relate to their daily lives and financial situations. Special emphasis will be placed on empowering women and other marginalized groups to participate in financial decision-making and access credit. The training will be delivered through workshops and seminars, as well as through informational materials such as brochures, videos, and radio programs. The project will also establish peer learning groups, where members can share their experiences and learn from one another. By improving financial literacy, the project aims to empower community members to make informed financial decisions, increase their savings, and access credit for productive investments. This will contribute to the overall economic resilience of the community and support the sustainable management of water resources.

Sub activities

- Develop a comprehensive financial literacy training curriculum tailored to the needs of RUSACCO members.
- Provide capacity-building support to existing and new RUSACCOs on organizational management, financial management, and governance.
- Conduct participatory training sessions covering topics such as budgeting, saving, borrowing, and investing.
- Incorporate practical exercises and case studies to enhance learning and application of financial concepts.
- Provide post-training follow-up and support to reinforce the knowledge and skills acquired.4,700

Deliverables:

- Workshop materials and attendance records.
- Financial literacy handouts.
- Peer learning group session reports

Activity 1.4.3: Define Revolving Fund Terms Including Repayment Schedules *(MOIL)*

136. The revolving fund established by the project will be governed by clear and transparent terms and conditions, including repayment schedules, eligibility criteria among others. This activity will involve developing these terms in consultation with IUA/WUA members, RUSACCOs, and other stakeholders to ensure they are fair and appropriate for the local context. The terms will be designed to encourage responsible access to fund and repayment, while also providing flexibility to accommodate the diverse needs and circumstances of communities. Once the terms are established, the project will conduct outreach and education activities to ensure that beneficiaries of the revolving understand the requirements and obligations associated with the revolving fund. This will include information sessions, informational materials, and one-on-one consultations with RUSACCO staff. The project will also establish a monitoring and evaluation system to track the performance of the revolving fund, including fund disbursement, repayment rates, and the impact of the fund on the livelihoods of beneficiaries. This system will help identify any challenges or issues that arise and allow for adjustments to be made to improve the fund's effectiveness and sustainability.

Sub-activities

- Consult with RUSACCO representatives, community members, and relevant stakeholders to understand their needs and preferences.
- Develop clear and transparent criteria for accessing the revolving fund, including eligibility requirements.
- Determine appropriate revolving fund repayment schedules, considering local economic conditions and beneficiaries capacities.
- Establish mechanisms for monitoring and enforcing repayment, including provisions for late payments or defaults.
- Communicate the revolving fund terms and conditions to RUSACCOs and potential beneficiaries.

Deliverables:

- Revolving fund terms and conditions document.

- Pilot phase evaluation report.
- Performance monitoring reports

Activity 1.4.4: Establish Revolving Fund *(MOIL)*

137. To ensure the revolving fund is adequately capitalized, a dedicated amount will be set aside by the CRGE Facility/ MOF to be distributed to the regional Bureaus of Finance in Amhara and Oromia regional states. This initial capitalization will provide the necessary funds to start disbursing the revolving fund to community members and support the establishment of the revolving fund facility. The project will also explore opportunities to leverage additional funding for the revolving fund, such as contributions from local governments, private sector partners, or other development programs. This could help increase the fund's capital base and enable it to provide more fund to a larger number of community members. By securing adequate funding for the revolving fund, the project aims to provide a sustainable source of interest free and repayable fund for investments in water infrastructure and other productive activities, supporting the economic resilience and development of the target communities.

138. Two RUSACCOs could be formed through Woreda level Cooperative Promotion Desks as per the Cooperative Societies Proclamation No 985/ 2016 or existing RUSACCOs will be revamped to serve the same purpose. The dedicated finance will be disbursed to these RUSACCOs, in the form of a revolving fund, through the respective regional Bureaus of Finance. For accountability purposes, the two RUSACCOs in Kobo Girana Valley and Borena zone will open a separate bank account to administer the revolving fund. The RUSACCOs will use the money for disbursement as revolving fund.

139. **Provision of revolving fund service to ISPs:** As stated in the proposal (and above), the RUSACCOs in Borana and Kobo are expected to administer the revolving fund to provide maintenance services of the irrigation facilities. The ISPs should be members of the RUSACCOs in order to access finance from the revolving fund. The Woreda Office of Irrigation and Lowlands and the Worea of Office of Water and Energy will ensure non-members will not access finance from the revolving fund. A total of USD 825,000 shall be managed under the revolving fund scheme.

Sub activities

- Conduct a financial analysis to determine the appropriate amount to be allocated to the revolving fund beneficiaries.
- Develop a sustainable financial plan for the revolving fund, considering initial capitalization, operating costs, and potential revenue streams.
- Establish a separate accounting system and bank account for the revolving fund to ensure proper fund management.
- Implement robust financial controls and auditing mechanisms to ensure transparency and accountability.
- Develop a strategy for replenishing and growing the revolving fund over time.

Deliverables:

- Fund allocation report.
- Funding opportunity analysis.
- Accounting and reporting guidelines

Activity 1.4.5: Develop a Revolving Fund Management and Administration Guideline/Manual *(MOIL)*

140. A comprehensive guideline/manual for the management and administration of the revolving fund will be developed to ensure its effective and transparent operation. This manual will provide detailed instructions on all aspects of the fund's management, including application for fund and approval processes, disbursement procedures, repayment monitoring, and management of defaults. The manual will also include guidelines for record-keeping, reporting, and communication with beneficiaries of the fund, as well as procedures for handling disputes or grievances. By providing clear and consistent guidelines, the manual will help ensure that the revolving fund is managed in a fair and transparent manner and that all stakeholders understand their roles and responsibilities. The development of the manual will be a collaborative process, involving input from RUSACCOs, community members, and other stakeholders. This will help ensure that the guidelines are relevant and practical for the local context and that they reflect the needs and concerns of the community. Once completed, the manual will be distributed to RUSACCOs, IUA/WUAs members and other relevant stakeholders, and training will be provided on its use. The project will also establish a system for regularly reviewing and updating the manual to reflect changes in the local context or lessons learned from the fund's operation. By providing a clear and comprehensive framework for the management of the revolving fund, the manual will help ensure its long-term sustainability and success.

Sub activities

- Conduct a comprehensive review of best practices and existing guidelines for revolving fund management.
- Consult with RUSACCOs, financial experts, and relevant stakeholders to gather input and feedback.
- Develop a clear and detailed guideline/manual covering aspects such as fund governance, lending procedures, risk management, and reporting.
- Ensure that the guideline/manual incorporates principles of transparency, accountability, and inclusivity.
- Conduct training and dissemination activities to familiarize RUSACCOs and relevant personnel with the guideline/manual.

Deliverables:

- Management and administration manual.
- Stakeholder collaboration meeting notes.
- Training session reports

Component 2: Enabling Environment

141. Component 2 focuses on creating an enabling environment to support the sustainable deployment and scaling of the interventions under Component 1. This involves strengthening the policy and regulatory framework, enhancing technical and managerial capacities, and developing financial mechanisms to support the SWP systems. The component includes activities such as training programs for local technicians and officials, promoting gender-sensitive business models, and establishing a knowledge-sharing platform. These initiatives aim to build a robust ecosystem that facilitates the effective implementation and expansion of the SWP technology across Ethiopia. A key aspect of Component 2 is the digitalization of monitoring, reporting, and verification (MRV) systems. These systems enable accurate tracking of water usage and the performance of the SWP systems, ensuring accountability and transparency. The introduction of digital payment systems for water services also streamlines the management of water resources and financial transactions, promoting efficiency and sustainability. By building local capacity and knowledge, Component 2 empowers communities to manage water resources more effectively, contributing to long-term climate resilience and sustainable development.

142. Moreover, this component emphasizes the importance of gender inclusion and community participation. It integrates these considerations into the policy framework, ensuring that women and marginalized groups are adequately represented and benefit from the project's outcomes. By fostering an inclusive approach, the project aims to create a more equitable and resilient community structure. The capacity-building efforts under Component 2 also focus on enhancing local governance and ensuring the sustainability of the SWP systems, providing a model for replication in other regions and sectors.

Output 2.1: Relevant Regulations, Policies, and Guidelines Created or Strengthened

143. The project focuses on developing and strengthening regulatory frameworks at both national and regional levels to support sustainable groundwater abstraction and use. This includes reviewing existing regulations, identifying gaps, and introducing new policies that align with best practices for water management. The project also emphasizes the importance of gender equity and social inclusion in these regulatory frameworks, ensuring that vulnerable populations are protected and have equitable access to water resources. To implement these regulations effectively, the project provides training and capacity-building for government officials, regulators, and other stakeholders. This training includes workshops and seminars on the new regulations, as well as technical assistance to support their enforcement. The project also works with local communities to raise awareness about the regulations and their rights and responsibilities, promoting compliance and sustainable water use practices.

144. This output is critical for establishing a supportive enabling environment for sustainable water management. By setting clear and enforceable rules, the project ensures that groundwater resources are protected and used efficiently. The inclusion of gender and social considerations in the regulatory frameworks also promotes equity and social justice, supporting the broader goals of sustainable development. This output lays the foundation for long-term resilience and sustainability in water resource management.

Activity 2.1.1: Develop and Implement/Strengthen Robust National and Regional Licensing and Regulatory Frameworks for Groundwater Abstraction and Use *(MOWE and MOIL)*

145. This activity will focus on the development and strengthening of licensing and regulatory frameworks at both national and regional levels to govern groundwater abstraction and use. The project will work closely with government agencies, policymakers, and other stakeholders to review existing regulations and identify gaps or weaknesses that need to be addressed. This may include updating outdated laws, introducing new regulations, and strengthening enforcement mechanisms to ensure sustainable groundwater management. The project will also advocate for the inclusion of provisions that promote

gender equity, protect vulnerable populations, and support the sustainable use of water resources. To support the implementation of these regulations, the project will provide training and capacity-building for government officials, regulators, and other relevant stakeholders. This will include workshops, seminars, and technical assistance to help them understand the new frameworks and how to enforce them effectively. The project will also work with local communities to raise awareness about the importance of groundwater management and the new regulations, ensuring that they understand their rights and responsibilities. By establishing clear and enforceable regulations, the project aims to protect groundwater resources, promote sustainable water use, and support the long-term resilience of the target communities.

146. **Strengthening national and regional licensing and regulatory legal frameworks for abstraction and use of groundwater**, including the tariff system in order to have the expertise and evidence needed to design cost-reflective water tariffs within the sensitivity range presented above (led by MoIL, MOWE). Water pricing is new in rural Ethiopia, and the evidence and experience generated by the GCF-supported interventions will be central to further strengthening tariff-setting as a key pillar of replicating and upscaling SWP-based irrigation. MoIL is currently overhauling the regulatory framework for irrigation as part of developing the National Irrigation Programme, with support from AfDB. Tariff-setting will be led by MoIL, based on the regional water laws of Amhara and Oromia, which enable flexible tariff-setting by community-led organizations such as IUAs, representing the end-user beneficiaries. The proposed tariff levels have been calculated in the financial model with the objective to design cost-reflective tariffs that fully take into account all relevant costs, especially for operations and maintenance. Final tariff levels will be agreed between MoIL, regional water bureaus and IUAs based on actual costs of the intervention
    - Integration of GCF supported activities in sectoral resilience plans and NDC accounting and reporting
    - Advancing the vision and roadmap of the National Irrigation Programme (expanding operations to further rural areas and ensuring gender responsiveness)
    - Further updating and strengthening of technical quality benchmarks or standards for SWP technologies (e.g., energy efficiency of submersible pumps, solar PV, on-farm irrigation technology) as an eligibility criterion for bid pre-qualification, in collaboration with key stakeholders including MOWE, Ethiopian Standards Agency and Ethiopian Energy Authority
    - Ensuring that all bureaucratic procedures related to customs/tax exemptions for irrigation technology fully enable the smooth import and deployment of SWP technology taking into account regional and international experience and best practices
    - Introduction of tax and other policy incentives for local assembly/production of relevant equipment
    - Community-based, gender-sensitive approaches for organizing smallholder farmers in cooperatives to enable economies of scale
    - Consideration of introducing regulatory measures and/or carbon pricing on import tariffs to mitigate the use of diesel generators for water pumping (gradually phased in over time)

Sub-activities

- Conduct a comprehensive review of existing policies, regulations, and institutional frameworks related to groundwater management.
- Engage stakeholders, including relevant government agencies, water user associations, and experts, to gather input and recommendations.
- Draft or update licensing and regulatory frameworks for groundwater abstraction and use, considering sustainable management principles.
- Establish clear procedures and criteria for issuing licenses, monitoring compliance, and enforcing regulations.
- Conduct awareness campaigns and capacity-building activities to ensure effective implementation of the new/updated frameworks.

Deliverables:

- Revised regulatory framework documents.
- Training materials and attendance records.
- Community awareness campaign materials

Activity 2.1.2: Implement the Use of Digital Water Meters to Measure Groundwater Extraction at Each Borehole (MOWE)

147. To support the effective monitoring and regulation of groundwater use, the project will implement the use of digital water meters at each borehole. These meters will provide accurate and real-time data on the

volume of water extracted, helping to prevent over-extraction and ensure sustainable use of groundwater resources. The project will work with local authorities and water users to install and maintain the meters, providing training on how to use and interpret the data they provide. The data collected by the meters will be used to inform water management decisions, such as setting extraction limits or adjusting water tariffs.

148. The implementation of digital water meters will also support the enforcement of groundwater regulations by providing evidence of compliance or non-compliance. The project will establish procedures for regularly downloading and analyzing the data from the meters, and for using this data to identify and address any issues or violations. This may include working with water users to reduce their extraction, imposing fines or penalties, or taking other enforcement actions as necessary. By providing a reliable and transparent system for monitoring groundwater use, the project aims to promote sustainable water management and protect this vital resource for future generations.

Sub activities

- Develop a centralized data management system for collecting and analysing water extraction data (physical and chemical) from the digital meters.
- Establish protocols for data sharing and reporting to relevant authorities for monitoring and regulatory purposes.

Deliverables:

- Installed digital water meters.
- Data collection and analysis reports.
- Enforcement and management decision records

Activity 2.1.3: Update and Strengthen Technical Quality Benchmarks or Standards for Solar Water Pump Technologies Including Energy Efficiency Standards for Submersible Pumps and Solar PV Systems (MOIL and MOWE)

149. To ensure the use of high-quality and energy-efficient technologies, the project will update and strengthen technical quality benchmarks or standards SWP technologies (e.g., energy efficiency of submersible pumps, solar PV, on-farm irrigation technology) as an eligibility criterion for bid pre-qualification, in collaboration with key stakeholders including MOWE, Ethiopian Standards Agency and Ethiopian Energy Authority. This will include setting standards for the energy efficiency of submersible pumps, the quality and durability of solar PV systems, and other key components of the SWP systems. The project will work with technical experts, industry stakeholders, and government agencies to develop these standards, ensuring that they are based on the latest scientific and technical knowledge and are appropriate for the local context. It will also provide training and capacity-building for manufacturers, suppliers, and installers of SWP systems to ensure that they understand and comply with the new standards. This will include workshops, seminars, and technical assistance to help them improve the quality and efficiency of their products and services. Additionally, the project will work with relevant government agencies and other stakeholders to develop and implement a system for certifying and monitoring compliance with the standards, ensuring that only high-quality and energy-efficient technologies are used. By promoting the use of high-quality and energy efficient SWP technologies, the project aims to improve the sustainability and reliability of water supply systems and reduce their environmental impact.

Sub-activities

- Review existing technical standards and benchmarks for SWP technologies, including energy efficiency standards.
- Engage relevant stakeholders, including industry experts, manufacturers, and research institutions, to gather input and recommendations.
- Update or develop new technical quality benchmarks and standards, considering advancements in technology and best practices.
- Establish mechanisms for monitoring and enforcing compliance with the updated standards and benchmarks.
- Conduct awareness campaigns and capacity-building activities to ensure widespread adoption of the new standards and benchmarks.

Deliverables:

- Technical standards documents.
- Training completion certificates.
- Certification and monitoring system setup

Output 2.2: Digital Monitoring, Reporting, and Verification (MRV) and Payment System Established (MOWE and MOIL)

150. The project establishes a digital MRV system to enhance the transparency and accountability of water resource management. This system includes the installation of smart meters to monitor groundwater extraction and the development of a centralized platform for data collection and analysis. The MRV system provides real-time data on water usage, enabling more informed decision-making and efficient management of water resources. The project also supports the integration of the MRV system with national frameworks, ensuring consistency and coherence in data reporting and management. Training is provided to government officials, IUAs/WUAs, and local communities on how to use the MRV system and interpret its data. The project also explores the use of the MRV data for implementing tiered pricing structures, encouraging water conservation and ensuring the financial viability of water supply systems.

151. This output is essential for promoting sustainable water use and reducing wastage. The digital MRV system provides a reliable and transparent mechanism for monitoring water resources, supporting evidence-based decision-making and policy development. By integrating this system with national frameworks, the project ensures that water management is consistent and coordinated at all levels. This output contributes to the overall goal of sustainable water resource management and resilience building. The following activities will be implemented under this output.

152. The climate impacts of supported activities including gender responsiveness will be measured and integrated with Ethiopia's national MRV system and NDC and sustainable development goal (SDG) tracking and reporting framework. MoIL will commission the development and integration of digital technology and platforms into the procurement process for SWP. Digital technology means that electricity and water use will be measured through smart meters. The IT platform for tracking key impact indicators (water, electricity use) will be integrated into the central procurement of SWP technology, and may also enable digital payment mechanisms (enabling the use of Telebirr/Ethio Telecom) or comparable mobile money solutions to pay water fees) for IUAs in their collection of payments by their members. This is locally feasible as deployment of smart meters is integrated into the project design, and the use of smart phones even among rural farmers is fast evolving in Ethiopia[42].

153. Enhanced transparency, monitoring and data availability will enable quantity-based payments based on actual water usage established by IUAs through smart meters and raise awareness and incentivize efficiency of water usage and resulting behavioral change. The proposed digital technologies including smart meters used in the project will also streamline financial transactions by making, reducing the administrative overhead associated with traditional payment methods. Moreover, they will help simplify and automate MRV processes related to water usage and other factors, making them more efficient, cost-effective, and scalable. Better data availability and transparency on climate impacts can also be utilized for further results-based climate finance mobilization for upscaling this project as part of the paradigm shift. Data generated by smart meters enables to calculate mitigation and adaptation benefits precisely without substantial transaction costs, which is a great evidence base for mobilizing results-based finance.

154. Digital technologies will generate large amounts of data that can provide transparency needed for ensuring cost-efficient use of technologies, as well as for designing tariffs and mobilizing additional climate finance for replicating GCF-supported interventions across Ethiopia. The concerned digital payment and metering infrastructure is in particular smart meters for water and power use, with water meters provided to each customer/household. This entirely feasible in the local context as smart meters are centrally provided as part of the procurement/technical installation, mobile phones are widely available in rural areas.

Activity 2.2.1: Design and Development of Digital MRV Platform (Executing entity: MOIL)

155. The project will design and develop a digital platform to enhance the transparency and accountability of water resource management. This platform will provide a centralized system for collecting, storing, and analyzing data on water usage, groundwater levels, and the performance of water infrastructure. The MRV platform will be designed to be user-friendly and accessible, with features such as dashboards, reports, and alerts to help users monitor and manage water resources effectively. The platform will also include data security measures to protect the privacy and confidentiality of users' information. The development of the MRV platform will involve close collaboration with local stakeholders, including government agencies, water users, and technical experts. This will ensure that the platform meets the needs of its users and is compatible with existing systems and technologies. Once the platform is developed, the project will provide training and technical support to help users adopt and use it effectively. This will include workshops, webinars, and one-on-one training sessions, as well as user guides and

[42] Abebe, A. (2023). Farmers' willingness to pay for mobile phone-based agricultural extension service in northern Ethiopia. Cogent Food & Agriculture, 9(1). https://doi.org/10.1080/23311932.2023.2260605

online tutorials. By providing a reliable and transparent system for monitoring and reporting on water resources, the project aims to improve decision-making, accountability, and sustainability in water management.

Sub-activities

- Conduct a comprehensive requirements gathering process, involving relevant stakeholders and experts.
- Define the system architecture, data models, and integration points with existing systems.
- Develop the digital MRV platform, incorporating features for data collection, analysis, reporting, and verification.
- Implement robust security measures, including user authentication, data encryption, and access controls.
- Conduct rigorous testing and piloting of the platform to ensure functionality and usability.

Deliverables:

- MRV platform design and specifications.
- User manuals and training

Activity 2.2.2: Support the Integration of the Digital MRV System with the National MRV Framework (MOWE and MOIL)

156. To ensure the effective use and integration of the digital MRV system, the project will work with national and regional authorities to align the system with the existing MRV framework. This will involve reviewing and updating the national MRV framework to include new indicators, data sources, and reporting requirements related to water resource management. The project will also work with government agencies and other stakeholders to develop procedures for collecting, analyzing, and reporting data from the digital MRV system, ensuring that it is consistent with national standards and protocols. The integration of the digital MRV system with the national MRV framework will provide a comprehensive and coordinated approach to monitoring and managing water resources. It will enable government agencies and other stakeholders to access and use data from the MRV system for policy-making, planning, and enforcement purposes. The project will provide training and capacity-building for government officials and other stakeholders on how to use the MRV system and integrate its data into their work. By supporting the integration of the digital MRV system with the national MRV framework, the project aims to enhance the transparency, accountability, and effectiveness of water resource management at all levels.

Sub-activities

- Analyze the existing national MRV framework and identify integration points for the digital MRV system.
- Collaborate with relevant government agencies and stakeholders to ensure alignment with national standards and protocols.
- Develop data exchange protocols and interfaces for seamless integration between the systems.
- Conduct end-to-end testing and validation of the integrated systems.
- Establish governance mechanisms and data-sharing agreements to ensure data security and privacy.

Deliverables:

- Integrated MRV system.
- Data collection and reporting procedures.
- Training materials and session reports

Activity 2.2.3: Develop Training Material for the Digital MRV System and Conduct Training Sessions for Government Officials, IUAs, and Local Communities (MOIL)

157. To ensure the successful adoption and use of the digital MRV system, the project will develop comprehensive training materials and conduct training sessions for government officials, members of IUAs/WUAs, and local communities. The training materials will include user guides, tutorials, and case studies, providing practical information on how to use the MRV system and interpret its data. The materials will be designed to be accessible and easy to understand, with clear instructions and visual aids to help users navigate the system and perform key tasks. The training sessions will be conducted through a combination of workshops, webinars, and hands-on training sessions. These sessions will provide participants with the opportunity to learn how to use the MRV system, practice key skills, and ask questions. The project will also establish a helpdesk or support team to provide ongoing technical assistance and troubleshooting for users of the MRV system. By providing comprehensive training and support, the project aims to ensure that all stakeholders are able to use the MRV system effectively and make informed decisions about water resource management.

158. MOIL/ Ethiopian Water Technology Institute (EWTI) will strengthen a vocational training program on SWP and irrigation implemented with regional bureaus. The key purpose of this activity is to address the known

barrier of insufficient technical expertise with this new technology. Strengthening the skills of technical workers ensures the long-term efficiency and operation of the renewable energy and irrigation technology through decentralized availability of qualified technicians, in cooperation with regional water bureaus and water development enterprises, technology producers and importers, Ethiopian Energy Authority, Vocational Training Institutes, and other actors, such as Ethiopian Energy Authority, which involves in developing and enforcing energy efficiency standards and ensuring compliance with these standards

159. Similarly, the selection of vocational training institutes involves collaboration with key academic and regional bureaus to ensure comprehensive and high-quality training programs. The criteria include:

- Partnerships with Academic Institutions: Establishing collaborations with institutions such as the Faculty of Technology at Addis Ababa University and the Ethiopian Water Technology Institute (EWTI) to develop and deliver training programs.
- Experienced Trainers: Engaging experienced trainers and subject matter experts from relevant organizations to conduct practical hands-on training workshops.
- Inclusive Training Programs: Ensuring that training programs are designed to include both men and women, with a target of at least 35% women participants to promote gender inclusivity

160. After-sales support will be integrated into the procurement of SWP equipment in order to ensure proper maintenance throughout the technical lifetime of the SWP equipment (fully budgeted for in the financial model and water tariff design). The training and capacity development will be designed to include the participation of both men and women while ensuring at least 35% of participants are women.

Sub activities

- Develop comprehensive training materials, including user manuals, tutorials, and multimedia resources.
- Ensure that the training materials are tailored to the needs and literacy levels of different target audiences.
- Identify and train local facilitators or resource persons to deliver the training sessions.
- Conduct hands-on training sessions, covering system navigation, data entry, reporting, and troubleshooting.
- Establish a support system, such as a helpdesk or online forums, to address queries and provide ongoing assistance.

Deliverables:

- Training materials and user guides.
- Workshop and training attendance records.
- Helpdesk setup documentation

Output 2.3: Gender-Sensitive Business Models and Financial Instruments Identified

161. The project conducts a comprehensive assessment to identify gender-specific needs and barriers in accessing business models and financial instruments related to water resource management. Based on the findings, the project develops and promotes gender-sensitive business models that consider local gender roles in agriculture and water use. These models are designed to enhance the participation and benefits of women and men in economic activities related to water resources. To support the implementation of these business models, the project provides training programs on financial literacy, business management, and entrepreneurship. These programs are tailored to the needs of women and marginalized groups, empowering them to access and benefit from financial services. The project also works with financial institutions to develop and promote inclusive financial products and services, such as microfinance and credit guarantees.

162. This output is crucial for promoting gender equity and economic empowerment in the target communities. By addressing gender-specific needs and barriers, the project ensures that both women and men can participate fully in water resource management and related economic activities. The promotion of inclusive business models and financial instruments also supports the broader goals of sustainable development and resilience building. This output contributes to the economic well-being and social inclusion of all community members.

Activity 2.3.1: Identify Gender-Specific Needs and Barriers in Current Business Models and Financial Instruments (MOIL and MOWE)

163. This activity will involve conducting a comprehensive assessment to identify the gender-specific needs and barriers faced by women and men in accessing and benefiting from business models and financial instruments related to water resource management. The assessment will include surveys, interviews, and focus group discussions with a diverse range of stakeholders, including women, men, youth, and marginalized groups. The findings will provide valuable insights into the different roles and responsibilities

of men and women in water management, as well as the challenges they face in accessing finance, training, and other resources.

164. The assessment will also examine the impact of existing business models and financial instruments on gender equity and identify opportunities for improvement. This will include analyzing the design and implementation of these models and instruments, as well as the extent to which they consider and address gender-specific needs and barriers. The project will use the findings of the assessment to develop recommendations for more inclusive and gender-sensitive business models and financial instruments. These recommendations will be shared with stakeholders, including government agencies, financial institutions, and development partners, to inform their policies and programs.

Sub-activities

- Conduct a comprehensive gender analysis to understand the roles, responsibilities, and challenges faced by women in agriculture and water management.
- Engage with local women's groups, community leaders, and gender experts to gather insights and feedback.
- Evaluate existing business models and financial instruments to identify potential gender biases or exclusionary practices.
- Analyze data and statistics related to women's access to resources, decision-making, and economic opportunities.
- Document the findings and recommendations for addressing gender-specific needs and barriers

Deliverables:

- Gender assessment report.
- Analysis report on business models and financial instruments.
- Recommendations for inclusive models

Activity 2.3.2: Develop Business Models that Consider Local Gender Roles in Agriculture and Water Use (MOWE and MOIL)

165. Based on the findings of the gender assessment, the project will develop and promote business models that consider and address local gender roles in agriculture and water use. These models will aim to enhance the participation and benefits of women and men in water resource management and related economic activities. The project will work with local stakeholders, including women's groups, farmers' associations, and financial institutions, to design and pilot these models. This will include developing new products and services that meet the specific needs of women and men, as well as adapting existing models to be more inclusive and gender sensitive. The project will also provide training and capacity-building for stakeholders on the design and implementation of gender-sensitive business models. This will include workshops, seminars, and technical assistance to help them understand and address gender-specific needs and barriers. Additionally, the project will work with financial institutions to develop and promote financial products and services that are accessible and affordable for women and men. This may include providing microfinance, credit guarantees, and other financial instruments that support the participation of women in water resource management and related economic activities. By promoting gender-sensitive business models and financial instruments, the project aims to enhance gender equity and empower women in the target communities.

Sub-activities

- Review the findings from the gender analysis and stakeholder consultations.
- Collaborate with gender experts, community representatives, and business development specialists to design inclusive business models.
- Incorporate strategies to address gender-specific needs, such as flexible working arrangements, access to childcare, and equal decision-making opportunities.
- Explore innovative approaches, such as women-led cooperatives, collective bargaining, and gender-responsive value chains.
- Pilot and refine the business models through iterative testing and feedback from local communities.

Deliverables:

- Gender-sensitive business models documentation.
- Pilot evaluation report.
- Training materials and session reports

Activity 2.3.3: Conduct Training Programs on Gender-Sensitive Business Models and Financial Instruments (MOWE and MOIL)

166. To support the adoption and implementation of gender-sensitive business models and financial instruments, the project will conduct training programs for key stakeholders, including government officials, financial institutions, and local communities. These training programs will cover a range of topics, including the design and implementation of gender-sensitive business models, the development of inclusive financial products and services, and the promotion of gender equity in water resource management. The training will be delivered through workshops, seminars, and hands-on training sessions, as well as through informational materials such as guides, manuals, and online resources. The training programs will also include a focus on building the capacity of women and men to access and benefit from business models and financial instruments. This will include providing training on financial literacy, business management, and entrepreneurship, as well as on how to access and use financial services. The project will work with local women's groups and other community organizations to ensure that the training is accessible and relevant to the needs of all community members. By providing training and capacity-building on gender-sensitive business models and financial instruments, the project aims to enhance the economic empowerment and resilience of women and men in the target communities.

Sub-activities

- Develop comprehensive training curricula and materials on gender-sensitive business practices and financial literacy.
- Engage local facilitators and resource persons with expertise in gender mainstreaming and economic empowerment.
- Conduct interactive training sessions, incorporating case studies, role-playing, and practical exercises.
- Tailor the training content and delivery methods to ensure accessibility and cultural relevance.
- Provide post-training support and follow-up to reinforce the knowledge and skills acquired.

Deliverables:

- Training program curriculum.
- Training attendance records.
- Financial service access documentation

Activity 2.3.4 Conduct workshops and training sessions for IUAs, RUSACCOs, and local communities (MOWE and MOIL)

To enhance the capacity and operational efficiency of IUAs, RUSACCOs, and local communities, the project will organize comprehensive workshops and training sessions. These trainings will focus on improving agricultural practices, financial management, and community-led development initiatives. Training on efficient irrigation techniques will cover modern irrigation methods, water conservation strategies, and maintenance of irrigation systems, illustrated with successful case studies. Cooperative management sessions will delve into principles of governance, financial management, best practices in administration, and the role of cooperatives in community development. For savings and credit operations, the training will provide fundamentals of savings and revolving fund management and operations, and strategies to enhance financial literacy among members. The capacity-building efforts will empower IUAs and RUSACCOs to operate effectively and sustainably, enhance financial literacy and management skills, and promote community participation and ownership of development initiatives. The project aims to improve agricultural practices and water management, enhance the financial management and operational efficiency of RUSACCOs, increase financial inclusion and access to finance for rural communities, and strengthen community resilience and sustainable development practices. Implementation will be supported by the (MOWE and MOIL, in collaboration with local women's groups and community organizations. Through these comprehensive training and capacity-building initiatives, the project seeks to foster a more inclusive and effective approach to irrigation and financial management, ultimately supporting the sustainable development and resilience of rural communities.

Sub activities:

- Organize workshops and training sessions targeting IUAs, RUSACCOs, and local community members.
- Facilitate discussions on the importance of gender inclusivity in business models and financial instruments.
- Share best practices and success stories from other regions or initiatives.
- Encourage active participation and feedback from attendees to identify contextual challenges and opportunities.

- Develop action plans and follow-up mechanisms to support the implementation of gender-sensitive approaches.

Deliverables

- Comprehensive workshop and training session report.
- Summary report on gender inclusivity discussions, detailing key points, participant contributions, conclusions, and recommendations.
- Best practices and success stories compilation document.
- Feedback analysis report.
- Action plan and follow-up mechanism document.

Output 2.4: Local Technicians Trained on O&M of SWP and Irrigation Systems

167. To ensure the effective operation and maintenance of SWP and irrigation systems, the project conducts a comprehensive needs assessment to identify the specific skills required. Based on the findings, the project develops and delivers training programs for local technicians, focusing on technical skills, safety, and best practices. The training programs are delivered through workshops, seminars, and hands-on sessions, providing practical experience in system installation, operation, troubleshooting, and maintenance. The project partners with academic institutions and regional bureaus to deliver high-quality training, ensuring that participants receive up-to-date and relevant knowledge. The training also includes soft skills such as communication, teamwork, and leadership, enabling technicians to work effectively in teams and communicate with other stakeholders. The project provides follow-up support and mentoring to ensure that the trained technicians can apply their skills in practice and address any challenges that arise.

168. This output is essential for building local capacity and ensuring the sustainability of the SWP and irrigation systems. By equipping local technicians with the necessary skills and knowledge, the project ensures that the systems are maintained and operated effectively, reducing the risk of breakdowns and system failures. The training also creates local employment opportunities and supports the development of a skilled workforce, contributing to the overall resilience and development of the target communities.

Activity 2.4.1: Conduct a Needs Assessment to Identify the Specific Skills Required for O&M of SWP and Irrigation Systems (MOWE)

169. To ensure the effective operation and maintenance (O&M) of SWP and irrigation systems, the project will conduct a comprehensive needs assessment to identify the specific skills required. This assessment will involve consultations with local technicians, water user associations, and other stakeholders to understand the current skill levels and training needs. The assessment will also include a review of existing training programs and resources, as well as an analysis of the technical requirements of the SWP and irrigation systems being implemented in the project. The findings of the needs assessment will be used to develop a tailored training program that addresses the specific skills required for the O&M of SWP and irrigation systems. This may include technical skills such as system installation, operation, troubleshooting, and maintenance, as well as soft skills such as communication, problem-solving, and teamwork. The training program will be designed to be accessible and relevant to the needs of local technicians and other stakeholders, with a focus on practical, hands-on learning. By conducting a needs assessment and developing a tailored training program, the project aims to build the capacity of local technicians and ensure the long-term sustainability of the SWP and irrigation systems.

Sub-activities

- Organize workshops and training sessions targeting IUAs, RUSACCOs, and local community members.
- Facilitate discussions on the importance of gender inclusivity in business models and financial instruments.
- Share best practices and success stories from other regions or initiatives.
- Encourage active participation and feedback from attendees to identify contextual challenges and opportunities.
- Develop action plans and follow-up mechanisms to support the implementation of gender-sensitive approaches.

Deliverables:

- Needs assessment report.
- Tailored training program documentation.
- Stakeholder consultation records.

Activity 2.4.2: Organize Training Workshops in Collaboration with Academia and Regional Bureaus (MOWE)

170. Based on the findings of the needs assessment, the project will organize training workshops in collaboration with academic institutions and regional bureaus. These workshops will provide local technicians and other stakeholders with the knowledge and skills needed for the effective operation and maintenance of SWP and irrigation systems. The training will be delivered by experienced trainers from academic institutions, technical schools, and other specialized organizations, ensuring that participants receive high-quality, up-to-date training. The workshops will be designed to be practical and hands-on, with a focus on real-world applications and problem-solving. Participants will have the opportunity to work with actual SWP and irrigation systems, gaining experience in installation, operation, troubleshooting, and maintenance. The training will also include sessions on safety and best practices, ensuring that participants are equipped to operate the systems safely and efficiently. In addition to the technical training, the workshops will also include sessions on soft skills such as communication, teamwork, and leadership, helping participants to work effectively in teams and communicate with other stakeholders. By organizing training workshops in collaboration with academia and regional bureaus, the project aims to build the capacity of local technicians and other stakeholders, ensuring the long-term sustainability of the SWP and irrigation systems.

Sub-activities

- Establish partnerships and collaborations with the Faculty of Technology at the Addis Abeba University, Ethiopian Water Technology Institute (EWTI) and relevant regional bureaus nationally for organizing the training workshops.
- Develop comprehensive training curricula and materials based on the identified skill requirements and best practices.
- Engage experienced trainers and subject matter experts from EWTI, regional bureaus, and other relevant organizations.
- Organize practical, hands-on training workshops covering topics such as system installation, maintenance, troubleshooting, and repair.
- Incorporate field visits and on-site demonstrations to provide real-world experience for the local technicians.

Deliverables:

- Workshop materials and attendance records.
- Partnership agreements.
- Training completion certificates

Output 2.5: Knowledge Sharing and Coordination Platform Established

171. The project establishes a knowledge-sharing and coordination platform to enhance collaboration and information exchange among stakeholders involved in water resource management. The platform is developed based on a comprehensive needs assessment, identifying gaps in knowledge sharing and coordination. It includes features such as a knowledge repository, discussion forums, and collaborative tools, providing a centralized space for stakeholders to share best practices, lessons learned, and innovative solutions. The project also develops a knowledge management and dissemination strategy to guide the operation of the platform. This strategy outlines the goals and objectives of the platform, as well as the roles and responsibilities of stakeholders in contributing and accessing knowledge. The project provides training and technical support to help stakeholders use the platform effectively, including workshops, webinars, and user guides. This output is crucial for building a strong and coordinated network of stakeholders in water resource management. The knowledge-sharing platform facilitates the exchange of information and experiences, supporting the adoption of best practices and innovative solutions. By providing a space for continuous learning and collaboration, the platform enhances the capacity of stakeholders to address challenges and improve water management practices. This output contributes to the overall resilience and sustainability of water resource management in the target regions. The following activities will be implemented under this output.

172. The CRGE Facility at the Ministry of Finance is the key institution delivering climate mainstreaming and policy coordination across all GoE agencies. Hence the project aims to situate knowledge sharing and coordination at the CRGE Facility (co-managed by MOF and the Ministry of Planning and Development (MOPD), Ethiopia's NDA). This will enable the project to benefit from its convening power and networks

to explore synergies with related programs in Ethiopia and beyond to enhance overall effectiveness and transformational impact. It will also disseminate results of the project, in particular regarding the use of solar water pumping and community-oriented business models that can be replicated and upscaled in Ethiopia and the region. Currently, the MoPD manages a knowledge management focused project, which aims to set up systems to improve information exchange between the CRGE implementing entities, and to establish a community of practice. This can serve as an important platform for knowledge sharing and coordination. A detailed knowledge management plan is available in Annex 23.

173. Knowledge management coordinated by the CRGE Facility and MOIL will play a critical role in accelerating the use of regulatory improvements, building capacity and, most critically, demonstrating the viability of SWP technologies, gender-sensitive business models and appropriate financing instruments. Knowledge management also seeks to leverage synergies with related activities and work towards replication as a key factor in working towards a paradigm shift towards sustainable access to water and climate resilience in (semi)arid regions of Ethiopia. Awareness of the viability and transformational benefits of SWP in terms of increasing climate resilience of rural communities, decreasing emissions, increasing water and energy efficiency, decreasing costs (incl. forex) required to purchase fuel, decrease costs required to extend grid energy and increasing profitability of agricultural production will be strategically disseminated through the CRGE Facility to inform sectoral planning and other water supply projects and thereby achieve the transformational impact.

Activity 2.5.1: Identify Key Stakeholders and Conduct a Comprehensive Needs Assessment to Identify Gaps in Knowledge Sharing and Coordination (MOWE and MOIL)

174. The first step in establishing a knowledge-sharing and coordination platform will be to identify key stakeholders and conduct a comprehensive needs assessment to identify gaps in knowledge sharing and coordination. The project will work with local communities, government agencies, non-governmental organizations, and other stakeholders to identify the key actors involved in water resource management and related activities. The needs assessment will include surveys, interviews, and focus group discussions to gather information on the current state of knowledge sharing and coordination, as well as the specific needs and challenges faced by stakeholders. The findings of the needs assessment will provide valuable insights into the gaps and barriers in knowledge sharing and coordination, as well as the opportunities for improvement. This information will be used to inform the design and development of the knowledge-sharing and coordination platform, ensuring that it meets the needs of its users and addresses the key challenges identified. The project will also work with stakeholders to identify best practices and successful models of knowledge sharing and coordination, which can be incorporated into the platform. By identifying key stakeholders and conducting a comprehensive needs assessment, the project aims to establish a knowledge-sharing and coordination platform that supports effective water resource management and community development.

Sub-activities

- Map out the key stakeholders involved in solar water pumping and irrigation systems, including government agencies, research institutions, NGOs, and community organizations.
- Engage with these stakeholders through surveys, interviews, and focus group discussions to understand their knowledge-sharing and coordination needs.
- Analyze existing mechanisms and platforms for knowledge sharing and coordination, and identify gaps and challenges.
- Assess the technical infrastructure and digital literacy levels of stakeholders to ensure an inclusive and accessible platform.
- Document the findings and prioritize the critical knowledge-sharing and coordination needs.

Deliverables:

- Stakeholder list.
- Needs assessment report.
- Platform design specifications

Activity 2.5.2: Development of Knowledge Management and Dissemination Strategy (MOWE, MOIL)

175. Based on the findings of the needs assessment, the project will develop a knowledge management and dissemination strategy to support the establishment and operation of the knowledge-sharing and coordination platform. This strategy will outline the goals, objectives, and key activities of the platform, as well as the roles and responsibilities of the various stakeholders involved. The strategy will also include a detailed plan for the collection, organization, and dissemination of knowledge and information, including the use of digital tools and technologies. The knowledge management and dissemination strategy will

focus on promoting the sharing of best practices, lessons learned, and innovative solutions among stakeholders, as well as enhancing the capacity of local communities to access and use knowledge and information. The project will work with stakeholders to develop and implement the strategy, including the creation of a knowledge repository, the organization of workshops and training sessions, and the development of communication materials such as newsletters, reports, and videos. By developing a knowledge management and dissemination strategy, the project aims to enhance the sharing and use of knowledge and information among stakeholders, supporting effective water resource management and community development.

Sub-activities

- Establish a cross-functional team with representatives from the key stakeholder groups to oversee the strategy development.
- Define the objectives, scope, and target audience for the knowledge management and dissemination strategy.
- Identify the types of knowledge and information to be shared, such as best practices, research findings, technical guidelines, and case studies.
- Determine the appropriate channels and formats for knowledge dissemination, such as online platforms, publications, workshops, and training events.
- Develop a plan for monitoring, evaluating, and updating the strategy to ensure its effectiveness and relevance.

Deliverables:

- Knowledge management and dissemination strategy.
- Digital tools and technologies integration plan.
- Strategy implementation reports

Activity 2.5.3: Design and Develop the Online Knowledge-Sharing and Coordination Platform (MOF, MOWE and MOIL)

176. The final step in establishing the knowledge-sharing and coordination platform will be to design and develop an online platform that supports the sharing and dissemination of knowledge and information among stakeholders. The platform will be designed to be user-friendly and accessible, with features such as a knowledge repository, discussion forums, and collaborative tools. The platform will also include data security measures to protect the privacy and confidentiality of users' information. The project will work with stakeholders to develop the platform, including the selection of appropriate technologies and tools, the design of the user interface, and the development of content and resources. The platform will be tested and refined based on feedback from users, ensuring that it meets their needs and is easy to use. Once the platform is launched, the project will provide training and technical support to help users adopt and use the platform effectively. This will include workshops, webinars, and one-on-one training sessions, as well as user guides and online tutorials. By designing and developing an online knowledge-sharing and coordination platform, the project aims to enhance the sharing and use of knowledge and information among stakeholders, supporting effective water resource management and community development.

Sub-activities

- Based on the needs assessment and strategy, define the functional requirements and specifications for the online platform.
- Identify and engage with experienced web developers and user experience designers to create a user-friendly and accessible platform.
- Incorporate features such as document repositories, discussion forums, news and event calendars, and collaboration tools.
- Ensure the platform adheres to best practices in terms of security, data protection, and accessibility standards.
- Conduct user testing and gather feedback from stakeholders to refine and improve the platform before its official launch

Deliverables

- Online platform setup.
- Platform content and resources.
- User training and support documentation

B.4. Implementation arrangements (max. 1500 words, approximately 3 pages plus diagrams)

Project Management, Implementation and Execution of Structure

Role of Federal Level Stakeholders

177. **Ministry of Finance**- has the mandate, capacity, and experience of overseeing financial management and project implementation in Ethiopia. As an AE to the GCF, MOF will assume oversight of the project as defined in the Accreditation Master Agreement (AMA) between GCF and MOF (AE). As AE, MOF will assume full financial and programmatic management accountability for the funds disbursed from the GCF. MOF, in its capacity as the AE, has overall responsibility and oversight for project preparation, project implementation and supervision, financial management, and reporting. MOF has established and operationalized the CRGE Facility in order to access and mobilize climate finance from bilateral and multilateral sources and support the implementation of climate change projects and programs originating from the CRGE Strategy, NDC, NAP and the Ten Years Development Plan. The CRGE Facility, which is a dedicated climate finance entity within MOF, closely collaborates with the federal level CRGE implementing Ministries including Ministry of Agriculture, Ministry of Water and Energy, Ministry of Irrigation and Lowlands, Ministry of Urban and Infrastructure Development, Ministry of Transport and Logistics, Ministry of Trade and Industry and other agencies. For this project, the Ministry of Irrigation and Lowlands and Ministry of Water and Energy act as Executing Entities. The Ministry of Finance will sign a separate Memorandum of Understanding (MOU) with both EEs at the initial stage of the project implementation. MOF will not effect project fund disbursement before signing the MOU. The Facility also engages with private sector stakeholders and other non-state actors who are working on climate change mitigation and adaption actions. The CRGE Facility coordinates, leads and ensures the delivery of MOF's related tasks with regard to this GCF project. MOF is currently leading the implementation of a GCF approved Project, FP058.[43] MOF will administer project funds on behalf of the GCF and will provide oversight guidance and quality assurance of MOWE and MOILLs as EEs receiving GCF funds. MOF, MOWE and MOIL have a proven track-record of administering international climate and development finance. MOWE is one of the EEs of the ongoing GCF project. (e.g., see small project grant approved in 2016 entitled "*Responding to the increasing risk of drought: building gender-responsive resilience of the most vulnerable communities*" that targets different intervention sites in Ethiopia, and provides excellent experience of improving institutional governance arrangements and local implementation on the ground. MOWIE is currently managing projects such as "Access to Distributed Electricity and Lightning in Ethiopia with a budget of USD 500 million, Ethiopia Electrification Program with a budget of USD 375 million, Second Urban Water Supply and Sanitation with a budget of USD 463 million, Ethiopia Geothermal Project with a budget of USD 206 million, Rural Electricity Access Phase II with a total budget of USD 130 million". During the past decade, this entity has lead and coordinated the implementation of several programs and projects. Ministry of Irrigation and Lowlands is also implementing projects and programs that have major national significance. Currently, this entity is implementing projects such as "Lowlands Livelihoods Resilience Phase II" with a total budget of USD 340 million.

178. The CRGE Facility will assign dedicated technical and financial project staff at the various tiers of governance (see Figure 4 Project Reporting Path) that will facilitate fund disbursement, compile periodic reports; conduct monitoring and evaluation and ensure compliance to the environmental, gender and social safeguard standards of the project. The CRGE Facility, in addition to its existing Operational Manual, will develop a Project Implementation Manual (PIM) (under component 2) that elaborates fund management at the various levels of governance, consistent with GCF regulations. It will also ensure that MoIL and MOWE are aligned with the PIM in implementing the project.

179. The CRGE Facility/Ministry of Finance as the Direct Access Entity manages a number of GCF and Adaptation Fund projects. One of the main learnings from the first rounds of projects implemented by the Ministry of Finance is the need to create a resource center for learning and knowledge management between projects and within a project. This center will provide support to the MoIL Programme Coordination team with regards to its knowledge management functions.

180. **Ministry of Irrigation and Lowlands-** The Ministry of Irrigation and Lowlands (MoIL) of the Federal Democratic Republic of Ethiopia is a critical government institution responsible for the development and management of the nation's irrigation infrastructure and the sustainable development of lowland areas. This Ministry aims to enhance agricultural productivity and food security by promoting efficient water use for irrigation and implementing strategies for the integrated development of Ethiopia's lowland regions. MoIL plays a pivotal role in addressing the unique challenges of these areas, including water scarcity, land degradation, and climate change impacts, to foster socio-economic development and resilience. MoIL has extensive experience and capacity in managing large-scale irrigation and lowland development

[43] See: GCF (n.d.): FP058: Responding to the increasing risk of drought: building gender-responsive resilience of the most vulnerable communities, https://www.greenclimate.fund/project/fp058 (accessed July, 26 2022)

projects, often financed by Multilateral Development Banks (MDBs) such as the World Bank and the African Development Bank. The Ministry has successfully implemented numerous initiatives aimed at improving irrigation systems, enhancing water resource management, and supporting the livelihoods of communities in lowland regions. These projects require comprehensive planning, coordination with various stakeholders, and adherence to international standards, showcasing the Ministry's strong project management capabilities. Examples include the Lower Omo Irrigation Project and the Pastoral Community Development Project, which have significantly contributed to agricultural productivity and community resilience in the respective areas. The Lower Omo Irrigation Project, financed by the World Bank, is a prominent initiative managed by MoIL with a budget of approximately USD 550 million[44]. This project aims to develop large-scale irrigation infrastructure in the Lower Omo Valley, enhancing agricultural production and supporting food security for local communities. Another significant project is the Pastoral Community Development Project, with a budget of around USD 350 million[45], also funded by the World Bank. This project targets the development of lowland areas, particularly those inhabited by pastoral communities, by improving access to water, promoting sustainable land management, and enhancing livelihoods. The Ministry of Irrigation and Lowlands is structured to ensure effective management and coordination of its diverse functions. The organizational structure includes a Minister, supported by State Ministers who oversee different sectors such as irrigation development, lowland development, and water management. Various directorates and departments within the Ministry focus on specific areas like irrigation infrastructure, water resource management, and community development. This structure enables a strategic approach to addressing the unique challenges of irrigation and lowland areas, ensuring that each sector receives adequate attention and resources. In terms of human capacity, MoIL employs a skilled workforce of engineers, agronomists, water resource experts, environmental scientists, and project managers. The Ministry prioritizes continuous professional development, offering training programs and workshops to enhance the technical and managerial skills of its staff. Collaborations with international organizations and development partners provide access to global expertise and best practices, further strengthening the Ministry's human resource capabilities. Additionally, MoIL is equipped with advanced technological tools and infrastructure, including Geographic Information Systems (GIS), remote sensing technologies, and modern irrigation equipment, which support effective planning and implementation of projects.

181. In this particular GCF project, MoIL is responsible for building and developing irrigation assets extracting water resources in line with the allocation extended by the MOWE. MoIL will closely collaborate with MOWE and other stakeholders at levels (federal, regional and woreda levels) at all times. MoIL will be solely responsible for procuring any SWP equipment and related infrastructure (see Annex 10 Procurement Plan). MoIL will also be responsible for anchoring the GCF-supported interventions within the National Irrigation Progamme currently under development, and related regulatory improvements and tariff-setting (see above). All the relevant departments within MoILs will be engaged in the project delivery. A representative from the women and social affairs directorate will be assigned to support and follow up on the project delivery focusing on the gender action plan.

182. **Ministry of Water and Energy-** is another key EE responsible for the allocation and provision of water and groundwater resources across sectors including hygiene and electrification. This ministry has extensive experience, expertise and capacity in leading flagship national programs and projects that have greater socio-economic and strategic significance to the country. The Ethiopia Urban Water Supply and Sanitation Project, financed by the World Bank, is one of the flagship projects managed by the Ministry of Water and Energy. With a budget of approximately USD 445 million[46], this project aims to improve the provision of water supply and sanitation services in key urban areas across Ethiopia. Another significant initiative is the Ethiopia Electrification Program (ELEAP), also funded by the World Bank, with a budget of around USD 375 million[47]. This program is designed to increase electricity access in rural areas, where most of the population resides and where electricity coverage is typically low. The Second Urban Water Supply and Sanitation Project, with a budget of USD 300 million[48], further exemplifies the Ministry's capacity to manage large-scale projects. This project focuses on enhancing the efficiency and sustainability of water supply and sanitation services in major Ethiopian cities. These projects highlight the Ministry of Water and Energy's proven track record in successfully managing complex, multi-million-dollar initiatives with significant socio-economic impacts. The Ministry's collaboration with the World Bank

[44] https://www.worldbank.org/en/country/ethiopia

[45] https://www.worldbank.org/en/country/ethiopia

[46] https://www.worldbank.org/en/country/ethiopia

[47] https://www.worldbank.org/en/country/ethiopia

[48] https://www.worldbank.org/en/country/ethiopia

and other Multilateral Development Banks has enabled it to secure the necessary financial resources and technical expertise to implement these projects effectively. Through these efforts, the Ministry continues to play a crucial role in advancing Ethiopia's development goals, particularly in the areas of water supply, sanitation, and energy access, which are vital for the country's sustainable development and resilience against climate change impacts. Cooperation between MoIL and MOWE is crucial and an integral part of project governance. Adjacent to the objectives of this proposal, MOWE is currently implementing the National Electrification Program (NEP), which is a USD 6 billion program with a specific focus on rolling out decentralized renewable energy in off-grid areas including productive purposes such as irrigation.[49] The NEP provides, next to other relevant policy frameworks like the NDC, important policy directives that underpin the project rationale. MoIL implication in the NEP helps align the proposed project with relevant policy directives in Ethiopia.

183. At the federal level, within the CRGE Facility and in each Executing Entity (EE), a Project Coordinator will be hired, who will be assisted by the existing Ministry staff that will oversee financial flows. The Project Coordinator will provide guidance and technical support to the regional level project officer. He/she will consolidate technical reports from the regions and submit to the CRGE Facility.

184. **The Ministry of Planning and Development-** also the Ethiopian NDA – provides a no-objection letter and has been involved in the project design and application process. Furthermore, it ensures close alignment between initiatives supporting the national NDC and will be represented in MILL's technical working group. It will also participate in the joint monitoring and supervision of the project on regular basis.

Relevant Rules, Regulations, and Permits for Implementing Project Activities in Ethiopia

185. Implementing project activities in Ethiopia, particularly those involving the use of groundwater, establishment of public water collection points, setting up and collecting water use fees, and importing solar panels and Rural Savings and Credit Cooperatives (RUSCCOs), requires adherence to a comprehensive framework of national policies, laws, and regulations.

186. **Groundwater Use Permits:** The use of groundwater in Ethiopia is regulated primarily by the Water Resources Management Proclamation No. 197/2000. This proclamation establishes the legal framework for managing, utilizing, and protecting the country's water resources. Under this law, any individual or entity intending to use groundwater must secure a permit from the Ministry of Water and Energy. The permit application process involves submitting detailed information about the purpose, volume, and method of groundwater extraction. Additionally, applicants must conduct an environmental impact assessment (EIA) to evaluate potential effects on the environment and surrounding communities. Compliance with water quality standards and regular monitoring is mandatory as prescribed by the ministry to ensure sustainable and responsible groundwater use. For small scale irrigation and potable water supply, the mandate to issue use permits rests with the Regional Water and Energy Bureau in each region.

187. **Establishment of Public Water Collection Points:** To establish public water collection points, several regulatory steps must be followed. The Public Health Proclamation No. 200/2000 ensures that these water collection points meet essential health and safety standards to prevent contamination and provide clean water to the public. Local governments are responsible for issuing permits for the construction of public water collection points. This process includes obtaining construction permits from the local municipality, ensuring that the location and design of the collection points adhere to public health guidelines and accessibility standards, and undergoing regular inspections and maintenance as required by local health departments.

188. **Setting Up and Collecting Water Use Fees:** Setting up and collecting water use fees are governed by Water Service Tariff Regulations, which provide guidelines to ensure that water service pricing is fair, transparent, and affordable. To establish a fee collection system, approval must be obtained from the local water authority. This involves setting up a transparent billing system in compliance with national and local guidelines. Regular audits and reports are essential to ensure compliance with tariff regulations and prevent exploitation of consumers.

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[49] Federal Democratic Republic of Ethiopia (2019): National Electrification Program 2.0; Integrated planning for Universal Access, Ministry of Water, Irrigation, and Energy, Addis Ababa

189. **Importing Solar Panels:** Importing solar panels into Ethiopia requires adherence to several laws and regulations. The Customs Proclamation No. 859/2014 outlines the procedures and requirements for importing goods, including solar panels. Additionally, the Energy Proclamation No. 810/2013 regulates the energy sector and the importation of renewable energy technologies. Importers must obtain import permits from the Ministry of Trade and Industry and ensure that the solar panels meet quality standards set by the Ethiopian Standards Agency (ESA). Furthermore, importers are required to pay applicable import duties and taxes unless specific renewable energy incentives exempt them.

190. **Rural Savings and Credit Cooperatives (RUSCCOs):** The regulation of Rural Savings and Credit Cooperatives (RUSCCOs) in Ethiopia is governed by the Cooperative Societies Proclamation No. 147/1998, which provides the legal basis for the formation, registration, and operation of cooperatives. The National Bank of Ethiopia (NBE) also issues directives to ensure that RUSCCOs adhere to sound financial practices and safeguard members' savings. RUSCCOs must register with the Cooperative Agency and obtain a license to operate. They are required to submit regular financial reports and undergo audits by the NBE. Compliance with anti-money laundering (AML) and combating the financing of terrorism (CFT) regulations is also mandatory.

Roles and Responsibilities of Sub-national Stakeholders

191. **Regional Level Stakeholders:** At this level of governance, Regional Bureau of Finance and Economic Development (BOFED), which an equivalent of the Federal Ministry of Finance, will receive GCF funds from MOF, transferring them over to regional irrigation or water bureaus that are responsible for oversight and commissioning of larger-scale irrigation projects in their territory. The BOFED may transfer funds to Woreda-level finance offices, for activities, which shall be executed by the Woreda-level irrigation Offices. This typical procedure (in line with Ethiopia's Channel One fund disbursement arrangement) depends solely on the capacities of regional or Woreda-level irrigation bureaus. In both regions one Project Officer will be hired (at least 50% of which will be women) to conduct regular monitoring, supervision, and oversight of project execution at Woreda level. The existing team in the regional sector bureau, including the Women and Social Affairs bureau, who are employed by the GoE will be assisting the Project Officers who will be employed under this project. Regions will issue tenders to attract specialized companies (public or private) as service providers for maintenance and protection of the SWP assets. The tendering process will be carried out in accordance with standard public procurement processes (see Annex 10).

192. **Woreda Level Stakeholders-** At the Woreda level, an expert within each of the 23 targeted Woredas will be hired (at least 50% of whom will be women) to provide technical input to beneficiary households and to conduct regular monitoring and follow up of the project implementation process in the designated Kebeles within the Woredas. In addition, finance officers will also be hired for each targeted Woreda to ensure that funds are effectively disbursed, utilized, monitored, and reported back to the CRGE Facility. The Woreda Office of Water and Energy and Office of Irrigation and Lowlands (the actual naming might be different from region to region or changes when restructuring takes place) will lead the implementation of project activities in line with their institutional mandates. The Women and Social Affairs Office will support and follow up on the implementation of the gender action plan. The Woreda Office of Finance will be responsible for project financial and procurement management including financial reporting. Under the oversight of the Woreda Administrator and direct supervision of the Heads of the two sector offices, the Woreda Level experts will run the day-to-day project activities and processes, engage stakeholders, and mobilize communities at target Kebele level.

193. **Kebele Level-** Woredas comprise several villages ("Kebeles") in which social organization will center around IUAs that will have a key role to play in the implementation and monitoring of the project. IUAs are self-governed organizations of farmers and/or pastoralists that intend to pool their financial, technical and human resources for the use and maintenance of a defined watershed, including domestic water use and irrigation agriculture.[50] These associations are the smallest water management units established at the community level and registered under and certified by the respective Woredas as per the regulations of the specific regional state (see for instance, Oromia Potable Water and Sewage Services Proclamation No. 228/ 2020; Proclamation # 841/ 2014). The law providing for the establishment of IUAs in each region provides guidance on their establishment, membership, management, service delivery, administration of fee structures, among others. The IUAs consist of beneficiaries who will conduct day-to-day operations of water schemes complementary to the public or private service providers. They will advise on the

[50] Sintayehu W. (2022): Water User Associations in Ethiopia, South South North, Addis Ababa

design, construction and maintenance of facilities and ensure all activities meet the needs of local communities and end-users. Where irrigation is not the intended use, associations are also referred to under alternative names, e.g., water user associations (WUAs). As per the gender action plan, IUAs/WUAs to be established / strengthened under this project will ensure the engagement of women both as members and leaders. These local community organizations with the support of the Woreda Office of Water and Irrigation and regional bureau of water and irrigation, will manage the SWP systems.

Project Governance and Coordination Arrangement

194. **Federal Level:** The CRGE Facility Management Committee, which is Chaired by MOF will govern and oversee the implementation of this project. All sector ministries involved in the CRGE strategy implementation including the Executing Entities of this project and the NDA are represented at State Minister level and high-level technical support from the civil service (Senior technical expert from the CRGE) in the CRGE Facility Management Committee. In addition, two key bilateral development partners and UNDP are members of the CRGE Facility Management Committee as an observer. The Committee will meet biannually to review the program's performance and provide strategic guidance to the CRGE Facility and the project executing entities. During the meeting, the Management committee shall review plans, implementation progress including financial and procurement management, reporting, provide guidance and direction to the project stakeholders. The committee also resolves any disputes that arise among the project executing entities and holds decision-making authority for their resolution. The CRGE Facility Management Committee provides strategic oversight and governance, ensuring the project's alignment with national climate resilience and green economy goals. This committee reviews financial and operational performance, resolves disputes among executing entities, and facilitates stakeholder engagement, including development partners and government agencies. It also supports capacity-building initiatives to enhance the skills and knowledge of implementing entities and stakeholders, meeting biannually to ensure compliance and strategic direction. The Ministry of Woman and Social Affairs will be actively engaged in the implementation of this project, though it is not yet part of the management committee. The EEs and the CRGE Facility will closely consult with the ministry, especially in ensuring the implementation of the gender action plan.

195. **Regional level**: The Bureau of Finance Economic Development (BOFED) will coordinate implementation of the project. The Bureau of Irrigation and Lowlands Development as well as the Bureau of Water and Energy are responsible for implementation of project activities in accordance with the legal mandates bestowed on them. A regional project steering committee co-chaired by the Bureau Head of Irrigation and Lowlands Development and Bureau Head of Finance and Economic Development will govern the project in Amhara and Oromia Regional States. The Bureau of Water and Energy, Planning and Development, Bureau of Women and Social Affairs will be members of the regional steering committee. The Regional Project Steering Committee supervises project implementation within the Amhara and Oromia regions, approving annual and quarterly work plans and budgets. This committee coordinates among regional bureaus and local governments and ensures effective stakeholder participation. It conducts biannual reviews of implementation progress, addressing challenges and bottlenecks, and promoting community engagement and capacity-building efforts to enhance local governance and project sustainability. This committee will have the following roles and responsibilities:

- Overall supervision for project implementation;
- Annual regional work plan and procurement plan review;
- Annual implementation performance report review;
- Oversee corrective actions implementation;
- Approval and endorsement of guidelines and manuals;
- Approval of best practices

196. Within this structure, the Bureau of Irrigation and Lowlands oversees irrigation projects and ensures sustainable water management practices. It provides technical support and guidance for implementing irrigation systems and collaborates with local governments to enhance agricultural productivity. The Bureau of Water and Energy manages water resources and energy systems, including the implementation of solar water pumping technologies. It ensures that water and energy resources are utilized efficiently and sustainably, aligning with regional development plans, and provides technical support and training to local stakeholders. These roles are defined by regional proclamations and regulations that mandate the bureaus to manage and oversee water, energy, and irrigation activities to promote sustainable development and climate resilience in the region.

197. **Woreda level**: A Woreda Steering Committee, which is chaired by the Woreda Administrator oversees the project implementation and renders overall guidance to the implementing sectors. The woreda

steering committee will be comprised of Woreda Office Administrator, heads of woreda offices (woreda office of finance, woreda office water and energy, woreda office of irrigation and lowlands, office of women, youth and social affairs, etc.) and project experts.The steering committee will meet on quarterly basis to review project implementation and take corrective measures if/when challenges are reported by the project coordination unit. It will ensure that all the plans and mitigation actions are plugged into the ground as well as to inform other on-going development projects to be aligned to the regulatory and institutional frameworks that shall be developed under this project. This body is the fundamental body in ensuring the Woreda plans are implemented at all Kebeles. The committee promotes gender and social inclusion, supporting capacity-building initiatives for local stakeholders, and aligning project activities with other ongoing development projects. The technical experts, hired at the woreda level, in close collaboration with other project stakeholders are responsible for the day-to-day implementation of the project in accordance with the approved work plan. Wherever possible, depending on the actual constitution of the Woreda level experts, the project will ensure at least 50% of the steering committee members are women. By addressing barriers to inclusion and fostering local ownership, the committee ensures that the project effectively enhances climate resilience and sustainable development in the targeted woredas, creating a solid foundation for the long-term success of the project. Through the collaborative efforts of the Woreda Office of Finance, the Woreda Office of Irrigation and Lowlands, and the Woreda Office of Water and Energy, the project aims to build local capacity and ensure the sustainability of its outcomes. The Woreda Office of Finance plays a crucial role in managing financial resources for the project, ensuring proper budgeting, disbursement of funds, and financial reporting, thereby ensuring transparency and accountability in the financial management of project activities. The Woreda Office of Irrigation and Lowlands oversees irrigation-related activities, ensuring the implementation of sustainable irrigation practices, providing technical support, monitoring irrigation projects, and collaborating with farmers to enhance agricultural productivity. The Woreda Office of Water and Energy manages water resources and energy systems, including the operation and maintenance of solar water pumping infrastructure. It ensures the efficient use of water and energy resources and provides technical training to local communities. These roles are defined by relevant Ethiopian laws and proclamations that mandate local governments to manage and oversee financial, irrigation, and water resources to support sustainable development and community resilience. Under the oversight of the Woreda Administrator and direct supervision of the Heads of the two sector offices, the Woreda Level experts will run the day-to-day project activities and processes, engage stakeholders, and mobilize communities at target Kebele level. The project technical officers at the woreda and MOF level will be responsible to contribute monitoring and evaluation (M&E) overlook gender responsiveness is ensured throughout the project implementation.

198. **RUSACCOs in Borena and Kobo-Girana:** Rural Savings and Credit Cooperatives have become a cornerstone of rural financial systems in Ethiopia, particularly in areas where formal banking services are scarce or non-existent. These cooperatives provide accessible and affordable financial services to smallholder farmers, rural entrepreneurs, and low-income households. Supported by government initiatives and international development programs, RUSACCOs have expanded rapidly across Ethiopia. Their growth is driven by the recognition that traditional banking models often do not meet the needs of rural populations, who require flexible, community-oriented financial services that align with their economic activities and seasonal income patterns.

199. The Ethiopian government, recognizing the importance of RUSACCOs in poverty alleviation and rural development, has implemented policies and programs to strengthen and expand these cooperatives. The government's Cooperative Promotion Agency (CPA) provides technical and regulatory support, helping RUSACCOs build capacity and improve governance. Additionally, partnerships with microfinance institutions and international donors have facilitated access to credit and financial resources, enabling RUSACCOs to scale their operations and reach more rural communities.

200. RUSACCOs play a pivotal role in promoting social cohesion and community development. By pooling resources and making joint financial decisions, RUSACCO members foster a sense of collective responsibility and mutual support. This social capital is particularly valuable in rural areas where formal institutions are often weak or absent. In addition to providing financial services, RUSACCOs serve as platforms for education and capacity building, offering training in business management, agricultural practices, and financial literacy. This holistic approach ensures that members are not only financially empowered but also equipped with the skills and knowledge needed to improve their livelihoods and contribute to the broader development of their communities.

201. A critical function of RUSACCOs is managing revolving funds, which are essential for sustaining long-term community development projects. These funds provide members with access to financial resources

for productive investments, such as purchasing agricultural inputs like seeds, fertilizers, and livestock. The revolving fund operates on a system where loans are repaid and then re-lent to other members, RUSACCOs in Kobo-Girana and Borena will be responsible for managing the revolving fund ensuring that financial resources are efficiently recycled within the community. By administering the revolving fund, RUSACCOs in the project target areas enable members to access capital for investments in climate-resilient agricultural practices and renewable energy technologies, such as solar water pumps. RUSACCOs play a crucial role in maintaining the integrity and sustainability of the revolving fund, ensuring that it serves as a reliable source of capital for ongoing and future development initiatives. Through their management of these funds, RUSACCOs help to build economic resilience, reduce poverty, and promote sustainable development in Ethiopia's rural areas.

202. **Kebele Level:** At the kebele level, the Local Governance and Implementation Arrangements focus on managing and maintaining project assets, such as solar water pumping systems. These arrangements mobilize community participation, fostering a sense of ownership and responsibility. They provide training and support for the operation and maintenance of project assets, ensuring sustainable agricultural practices. Regular monitoring and reporting are conducted, with progress reported to the woreda steering committee. The arrangements also address conflicts, develop sustainability plans, and ensure the active involvement of women and marginalized groups, promoting gender equality and social inclusion in project activities. Local governance and implementation arrangements shall be set up in a way that prioritizes local ownership and feasibility (Figure 3). This is achieved by building on existing IUA schemes, both for irrigation and potable uses. IUAs have a longstanding tradition and legal standing in Ethiopia. The central idea of the local governance and implementation structure is to separate maintenance of assets from the governance and use of assets. These clearly defined responsibilities are key to achieve long-term viability between government entities and private actors (i.e., farmers). This separation of tasks is currently successfully piloted as part of the DREAM project that operates several pilot sites of Ethiopia focusing on mini-grids, solar PV, and larger-scale irrigation, that shall serve as a blueprint for the proposed structure.

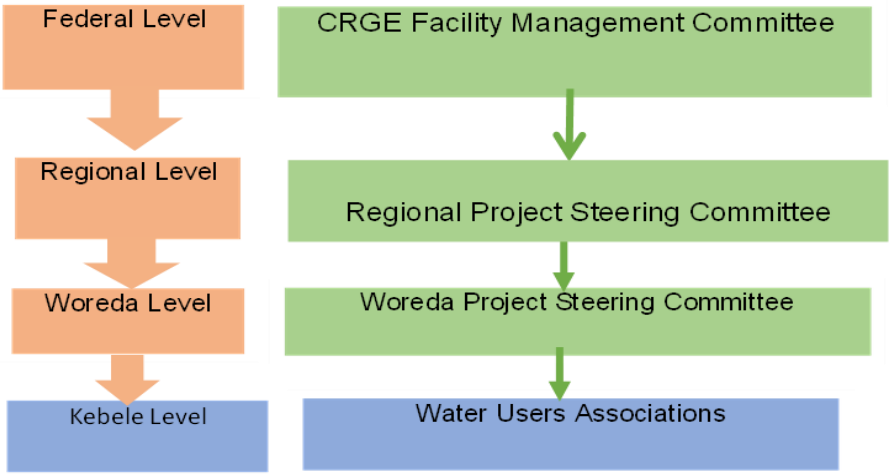


Figure 9: Local governance and implementation arrangements

Reporting and Fund Disbursement Arrangement

203. The flow of funds is fully aligned with the existing public finance flow arrangement which is known as “Channel one fund flow arrangement” in which MOF transfers fund received from the GCF to the relevant sub-national project implementing entities through the offices of finances. Received GCF funds will be deposited in designated GCF accounts of federal institutions as well as GCF accounts of the Bureau of Finance and Economic Development (BOFED) at the regions and Woreda Office of Finance and Economic Development (WOFED) accounts at the Woreda’s on a regular basis. MOF has been applying this funding disbursement arrangement to the ongoing GCF and other projects. Financial reporting follows the same channel, only in the reverse direction. The utilisation of funds will be monitored through an internal control framework, which depicts the funds transfer and reporting channels; it shows that funds received by a project account at the CRGE Facility are then channeled through the government structure - federal, regional and Woreda - and reported back through the same channels. This so-called “Channel

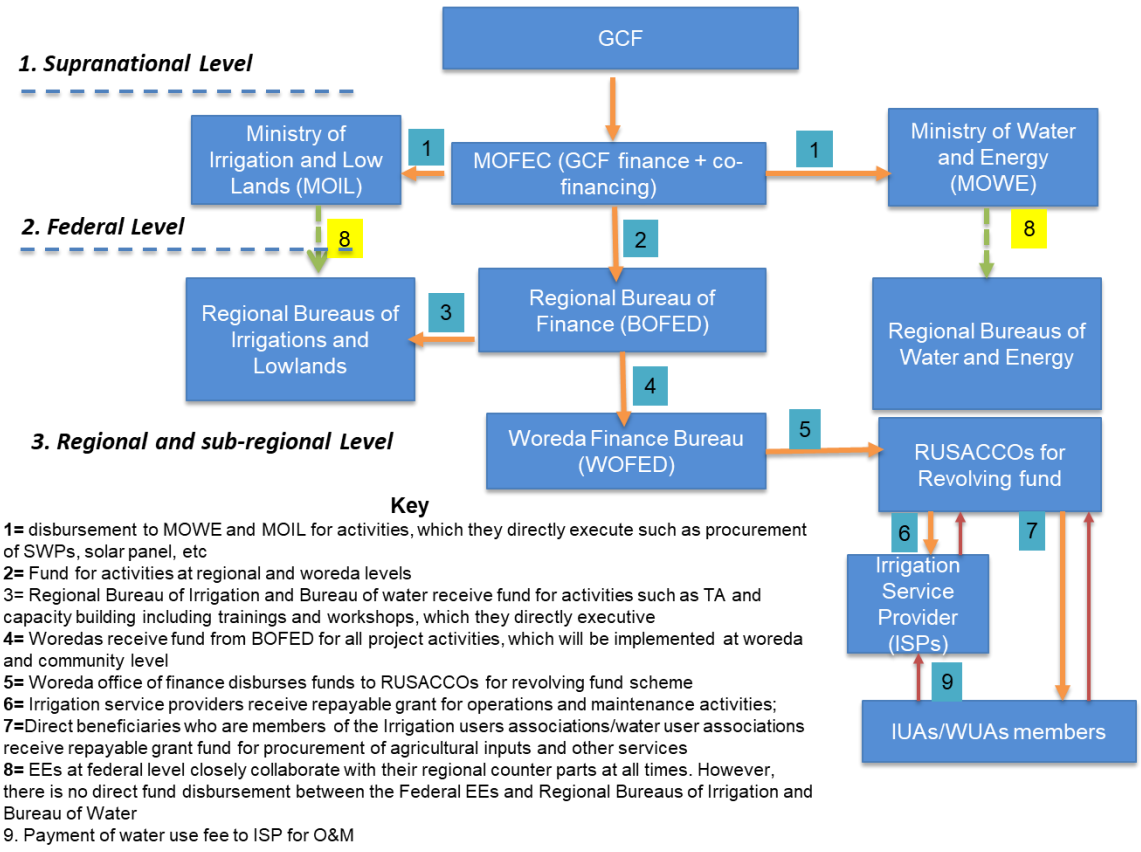
One Fund Disbursement and Financial Reporting" system is the standard disbursement and financial reporting arrangement in Ethiopia.

204. **Federal Level:** MOF directly transfers fund to MILL and MOWE for activities, which they directly implement including for procurement of solar technologies (CAPEX). The Federal executing entities only receive and retain funds for activities they directly execute (e.g., purchase of assets). Forwarded funds notably consist of staff costs or other project related operational costs.

205. **Regional Level:** The fund for regional and sub-regional level activities shall be channeled to the Bureau of Finances of the project target regions. The BOFED will make direct transfer to the Regional Sector Bureaus (irrigation or potable water use) and to the WOFEDs for activities at the local level. Both regional and woreda-level sector bureaus for irrigation, or water, are the official direct representatives of MoIL, or MOWE, respectively.

206. The project fund disbursement arrangement is presented in Figure 4.

Figure 10: Flow of funds.



Key

1= disbursement to MOWE and MOIL for activities, which they directly execute such as procurement of SWPs, solar panel, etc
2= Fund for activities at regional and woreda levels
3= Regional Bureau of Irrigation and Bureau of water receive fund for activities such as TA and capacity building including trainings and workshops, which they directly executive
4= Woredas receive fund from BOFED for all project activities, which will be implemented at woreda and community level
5= Woreda office of finance disburses funds to RUSACCOs for revolving fund scheme
6= Irrigation service providers receive repayable grant for operations and maintenance activities;
7=Direct beneficiaries who are members of the Irrigation users associations/water user associations receive repayable grant fund for procurement of agricultural inputs and other services
8= EEs at federal level closely collaborate with their regional counter parts at all times. However, there is no direct fund disbursement between the Federal EEs and Regional Bureaus of Irrigation and Bureau of Water
9. Payment of water use fee to ISP for O&M

207. Fund transfer to irrigation service providers both at regional and woreda levels will take place once the project executing entities and the service providers sign formal implementation and service provision agreement.

Project site and beneficiary selection

208. The federal and regional stakeholders include MOWE, MOIL, Regional Bureau of Irrigation, Regional Bureau of Water and Energy, Bureau of Finance and Economic Development among others. These will have direct role in the implementation of the project. Project direct beneficiaries will be selected based on a mutually agreed selection criteria. The selection criteria shall be developed with active participation of the project stakeholders including community representatives. The selection will take place after the launch of the project. The primary selection criterion for villages in this project is the presence of high-discharge boreholes previously drilled by the Ethiopian government but currently capped due to resource constraints. These villages are specifically targeted for the following reasons:

- Existing Infrastructure: The presence of already-drilled boreholes represents a significant opportunity for immediate impact with additional investment
- Resource Efficiency: By focusing on these villages, the project can maximize the use of existing resources and avoid duplication of efforts
- High Potential Impact: These high-discharge boreholes have the capacity to benefit a large portion of the community once operational
- Demonstration Effect: These villages offer an excellent opportunity to showcase how sustainable energy solutions can enhance community adaptive capacity
- Scalability and Replicability: The approach used in these villages can serve as a model for similar interventions across Ethiopia and potentially other African regions

By selecting villages with these characteristics, the project aims to efficiently leverage existing infrastructure, demonstrate sustainable water management practices, and create a scalable model for future interventions.

B.5. Justification for GCF funding request (max. 1000 words, approximately 2 pages)

209. Ethiopia's requirement for significant financial support to achieve its climate and development goals necessitates a justification for grant funding from the Green Climate Fund (GCF) rather than loans or other forms of financing. Here are key points supporting the justification for GCF grant funding for Ethiopia:

210. **Enormous Financial Needs:** Ethiopia requires USD 316 billion by 2030 to fully achieve its NDC/10YDP targets, which is being mobilized from own budget contributions, as well as climate finance from private sector, bilateral, and multilateral financial institutions.[51] Ethiopia needs more than USD 600 million per year to increase the resilience of the agricultural sector, and USD 1.5 billion per year for off-grid electricity to fully implement the NEP, including for sustainable irrigation.[52]

211. **Economic and Financial Constraints:** Ethiopia is a least developed country (LDC) and is listed as a heavily indebted poor country by the World Bank Group and the International Monetary Fund (IMF)[53]. The Country has experienced significant macro-imbalances and financing challenges including a sharp decline in external reserve buffers, foreign exchange shortages and a growing parallel market premium, and high inflation.it requires technical and financial support for the required climate interventions. Given these constraints, Ethiopia has already undergone a successful (voluntary) debt restructuring in 2020 and in 2021 applied for debt relief through the G-20 Common Framework. External financing needs remain large, and the need for a debt treatment under the G20 Common Framework urgent. Ethiopia faces a growing debt burden from debt service payments in the near term. The projected debt service payment of more than US$11 billion over the next 5 years—an average of $2.3 billion a year[54], with three-quarters highlights the severe debt burden the country faces, making additional loans unsustainable. The IMF recently approved of a $3.4 billion Extended Credit Facility (ECF) for Ethiopia. The approval of this program is driven by the need to address significant macroeconomic challenges, including high inflation, low international reserves, and unsustainable debt levels. The support aims to restore macroeconomic stability through comprehensive reforms, such as moving to a market-determined exchange rate, modernizing the monetary policy framework, and eliminating monetary financing of the budget. These measures are expected to combat inflation, reduce financial repression, and create space for priority public spending through improved domestic revenue mobilization.

212. **Inflation and Foreign Currency Challenges:** Since mid-2019, Ethiopia has seen skyrocketing inflation with annual rates exceeding 35% in April 2022[55]. The combination of COVID-19, conflict, and logistical constraints has exacerbated this situation. Given the rising consumer price indices and the increasing difficulty in servicing foreign currency-denominated debt, the country faces severe financial instability, making grants a preferable financing option over loans, which would add to the foreign currency debt burden. New technology typically needs to be imported using forex which is a crucial

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[51] Federal Democratic Republic of Ethiopia (2021): Updated Nationally Determined Contribution, https://unfccc.int/sites/default/files/NDC/2022-06/Ethiopia%27s%20updated%20NDC%20JULY%202021%20Submission_.pdf (accessed Julty 26, 2022)

[52] Federal Democratic Republic of Ethiopia (2019): National Electrification Program 2.0; Integrated planning for Universal Access, Addis Ababa

[53] World Bank (2018): International Development Association Program Appraisal Document on a Proposed Regular Credit In The Amount Of SDR 176.9 Million (USD 250 million) and a proposed Scale-Up Facility Credit in the amount of USD 125 million to the Federal Democratic Republic Of Ethiopia for the Ethiopia Electrification Program, World Bank

[54] World Bank (2024): Country Climate and Development Report for Ethiopia

[55] Trading Economics (2022): based on Central Statistical Agency Ethiopia.

barrier especially at early market penetration with low shares of local content. GCF grants in hard currency will thus be used for the CAPEX of assets and to establish the necessary enabling environment, as well as for technical assistance that is required for capacity development and training.

213. **Market and Institutional Gaps:** The private sector in Ethiopia is risk-averse, especially regarding unproven technologies. Additionally, there is a lack of financial products that appropriately capture the specific characteristics of the market (e.g., regarding collateral requirements). This lack of market readiness and financial infrastructure highlights the need for grants to introduce and scale new technologies without imposing additional financial risks on the private sector. Consideration has also been given to the options of borrowing from international development banks and tapping into capital market and foreign direct investment (FDI). LDCs are, in general, not favorably appraised by international capital markets. Ethiopia remains with high risk of external debt distress.[56] Ethiopia's FDI has declined from USD 4.9 billion in 2017 to USD 2.2 billion in 2020.[57] The current government has enacted reforms to open up the economy to private investments and competition to support sustainable growth.

214. **Public Good Nature of Climate Change Adaptation:** Many climate adaptation activities, such as enhancing access to safe and clean water for rural communities, generate public goods that cannot be easily monetized. These activities are essential for increasing climate resilience but do not attract private investment due to their non-revenue generating nature. Therefore, grant funding is necessary to bridge this gap and support these vital public goods. The past decade, which has seen recurrent droughts and an increased exposure of local communities to variations in climatic conditions, showed that water provision continues to fall short. As a common good, it falls short to speak of a 'market failure' in the context of water provisioning systems but rather insufficient institutional, technical, and financial capacities to provide basic need services to local populations. The project directly addresses this gap and aims at building these capacities over the long-term. While the government has increased its focus on climate finance, efforts to channel budgetary or other public resources to climate resilience in Ethiopia is still limited and scattered. The required investment for climate adaptation needs cannot be met with the national budget alone. With the economy expected to slow down, inflation risk, relatively high unemployment, public debt on the rise and persistent political instability, it will be difficult for the government to rise to the climate investment challenge.

215. **Alignment with international calls for grant funding for LDCs and Climate Change Adaption Actions:** The 26th Conference of the Parties (COP26) emphasized the need for scaling up grant finance, especially for adaptation efforts in LDCs. Ethiopia's climate adaptation needs align perfectly with this international call, further justifying the need for GCF grants.

216. **Characteristic financing structure for SWP:** Promoting the uptake of a recently introduced technology in the Ethiopian context needs to be aligned with the specific cost structure of SWP, which is characterized by very high CAPEX investments and only moderate OPEX (see section B, and D.6). Hence, the financing arrangements depend on the use of grants for overcoming access to finance barriers to deploy innovative SWP infrastructure and design community-led implementation arrangements that are based on cost-reflective water tariffs that ensure appropriate maintenance and operations of SWP infrastructure, complemented by technical assistance to strengthen the enabling environment.

217. **Impact and Capacity Building:** Grant funding from the GCF will be crucial in overcoming barriers and building capacities in rural populations to improve adaptive capacity against climate change through access water for irrigation and household use, thereby improving agricultural productivity. Grants will be used for capital expenditures, that cannot be mobilized either from government or private financial institutions establishing the necessary enabling environment, and providing technical assistance for capacity development and training. This comprehensive approach ensures the long-term sustainability and effectiveness of the interventions. Moreover, the project achieves broader agricultural and socioeconomic benefits in particular regarding the health of rural communities, which can be expressed in improved Healthy life expectancy (HALE) at birth (see D.6), improved agricultural yields which farmers can sell, and potentially additional employment opportunities through value-addition in associated agricultural value chains (e.g. the dairy sector). Moreover, the project achieves broader socioeconomic benefits in particular regarding increased access to safe water resulting health improvements of rural communities, improved agricultural productivity and associated income gains from better harvests which farmers can sell (see table 6), and potentially additional employment

opportunities through value-addition in associated agricultural value chains (e.g. the dairy sector), as well as environmental benefits such as mitigation co-benefits of the key objective to strengthen adaptation and resilience (see Annex 22, as well as table 6). More advanced methodological approaches to quantify these economic benefits, for instance by expressing them in improved Healthy Life Expectancy (HALE) at birth (see D.6), could be integrated into the M&E framework but require further adjustment to the specific context of the interventions. These broader benefits combined with higher end-user confidence in SWP as well as economy of scale effects resulting from upscaled implementation will prospectively allow the Ethiopian government to decrease and eventually phase out public grant support for SWP technology.

218. **Government Co-financing and commitment:** The Ethiopian government has committed to co-financing the proposed GCF project, matching the GCF contribution with significant financial commitments. This demonstrates the government's dedication to the project and enhances the justification for grant funding.

219. Given Ethiopia's high vulnerability to climate change, especially droughts, enormous financial needs, economic constraints, limited access to concessional loans, inflation and foreign currency challenges, market and institutional gaps, low capacities of the targeted vulnerable populations, the public good nature of climate adaptation, alignment with international grant funding calls, the impact and capacity-building potential, and the government's commitment, GCF grant funding is the most suitable and sustainable form of financing for Ethiopia's climate adaptation and mitigation efforts.

220. Based on the outcomes of the economic and financial analysis, the justification for financing the project through a grant rather than a loan includes the following points:

- **High Initial Capital Costs and Low Revenue Generation:** The project requires substantial initial capital investment for the installation and rehabilitation of solar water pumping systems and infrastructure. While the operational expenses (OPEX) can be covered through water tariffs, the revenue generated is insufficient to repay a loan, especially when considering the financial capacity of the local beneficiaries.
- **Limited Cash Flows and dependency of Financial Internal Rate of Return (FIRR) on GCF grants:** The financial analysis indicates a negative FIRR when considering both the GCF's and the Government of Ethiopia's funding contribution as a recoverable investment. The respective FIRR for the two intervention areas would be -11% (Kobo Girana, Cluster 1) and -14% (Borena, Cluster 2) (see Annex 2, Sheet: Summary, l27). However, despite this the long-term economic benefits are significant. The project's cash flow, generated through water tariffs, is designed to cover operational costs of SWP infrastructure, not to repay large capital investments. Grant financing, therefore, ensures the project's financial viability without imposing a repayment burden that could hinder its success.
- **Economic Benefits and Externalities:** The economic benefits of the project, such as improved agricultural productivity, enhanced food security, and reduced greenhouse gas emissions, are significant but are not directly monetizable in a way that would allow for loan repayment. These benefits accrue broadly to society and contribute to public welfare, making them more suitable for grant financing. The project generates externalities, such as improved public health and reduced environmental degradation, which are not captured in traditional financial returns.
- **Affordability and Accessibility for Beneficiaries:** The local beneficiaries, primarily poor smallholder farmers and rural communities, have limited financial resources and cannot afford higher user tariffs required for a loan. The project aims to provide essential services, such as water for drinking and irrigation, at an affordable rate.

B.6. Exit strategy (max. 500 words, approximately 1 page)

221. The project has been designed in order to contribute to a paradigm shift in sustainable access to safe water and food security in Ethiopia for vulnerable communities. The interventions focus on pioneering community-driven SWP for deep ground water resources as well as developing community-based business models for climate resilient access to safe water and agriculture. The long-lived nature of the supported assets (20 years or more for pumps and solar power equipment) ensures project results and benefits even after closure of the project (project duration: 7 years). The objective is to enable a smooth

[56] International Monetary Fund (IMF) (2018): The Federal Democratic Republic of Ethiopia. Staff Report For The 2017 Article Iv Consultation—Press Release; Staff Report; And Statement By The Executive Director For The Federal Democratic Republic Of Ethiopia, International Monetary Fund, Washington, D.C.

[57] World Bank (n.d): Foreign direct investment, net inflows (% of GDP) – Ethiopia, https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS?locations=ET (accessed July 19, 2022)

transition of asset maintenance from being GCF grant financed, to a combination of farmer's contributions through tariffs and a progressively phased out public subsidy.

222. More specifically, the following dimensions ensure sustainability during and beyond project implementation:

- **Policy coherence**: the project will be implemented embedded firmly within established institutional arrangements for achieving targets defined in Ethiopia's NDC, CRGE as well as the Growth and Transformation Plans (GTP I and II). This ensures full coordination among all relevant government agencies as well as synergies with other ongoing initiatives. Moreover, the activities directly contribute to GoE sectoral priorities such as the Universal Access to Water policy and agricultural transformation, thereby ensuring government ownership, support, and replication efforts.
- **Institutional sustainability:** One dedicated outcome of the project is to create and sustain skills for national staff, including technicians, policy makers and community engagement. This specifically aims at smoothening the transition by building up capacities at all levels (from local to federal) and thus contributing to long-term professional allegiance in the field of SWP and overall project sustainability.
- **Financial Sustainability**: The grant-financing of high upfront investment costs and proposed business models that rely on cost-reflective water tariffs will initiate self-sustaining value chains that generate revenues that can be used to maintain operations, thereby demonstrating viability to other stakeholders.
- **Competitive procurement:** Procurement will be implemented according to national and international standards ensures cost-efficiency and effectiveness.
- The revenues collected from water fees or **leasing out the infrastructure** shall be the main source of funds and enabling maintenance and replication. Legally established community organizations as main implementing organizations ensure that local value addition and benefit-sharing can be maximized.
- **Technical Sustainability**: Technical assistance for the enabling environment ensures an appropriate regulatory framework that enables beneficiaries to effectively implement the project. The project design and procurement will place a strong focus on operations and maintenance in order to ensure the operational capacity throughout technology lifetime. Maintenance costs will be fully included in tariff setting.
- The **MRV system** will be designed according to UNFCCC-approved standards so that other climate finance sources for mitigation (e.g., Article 6 market-based cooperation, bilateral and private sector investments) and adaptation, including from the private sector, can complement GCF funding in a harmonized approach that facilitates replication and upscaling beyond the scope of GCF-funded activities.
- Moreover, **harmonized MRV framework** of the project results will enable effective tracking and reporting of progress towards the updated NDC targets, as well as reporting towards achievement of SDGs. M&E systems and will benefit from using data generated by digital technologies (smart water and electricity meters) that facilitate these processes.

FINANCING INFORMATION

C.1. Total financing

(a) Requested GCF funding (i + ii + iii + iv + v + vi + vii)	**Total amount**	**Currency**
	44,994,677	USD ($)

GCF financial instrument	**Amount**	**Tenor**	**Grace period**	**Pricing**
(vi) Grants	44,994,677	7 years	NA	NA

(b) Co-financing information	**Total amount**	**Currency**
	4,988,098	USD ($)

Name of institution	**Financial instrument**	**Amount**	**Currency**	**Tenor & grace**	**Pricing**	**Seniority**
MOF	Grant	4,988,098	USD ($)	7 years	NA	Options

Total financing (c) = (a)+(b)	Amount	Currency
	49,982,775[58]	USD ($)
(d) Other financing arrangements and contributions (max. 250 words, approximately 0.5 page)		

C.2. Financing by component

Component	Output	Indicative cost million USD ($)	GCF financing		Co-financing		
			Amount million USD ($)	Financial Instrument	Amount million USD ($)	Financial Instrument	Name of Institutions
Component 1: Community Resilience	1.1. Solar water pumps installed	8.10	7.40	Grants	0.70	Grants	MOF
	1.2 Efficient water distribution system constructed for households, irrigation and livestock use	31.54	31.4	Grants	0.14	Grants	MOF
	1.3 Gender sensitive IUAs/Water Use Associations established and capacitated	0.70	0.64	Grant	0.061	Grants	MOF
	1.4: Small scale revolving fund facility established	3.00	1.9	Grants	1.10	Grants	MOF
Component 2: Enabling Environment	2.1: Relevant regulations, policies and guidelines created or strengthened	0.40	0.30	Grants	0.10	Grants	MOF
	2.2: Digital MRV, and payment system established	1.31	0.98	Grants	0.33	Grants	MOF

[58] These are rounded figures, the exact amounts disaggregated by activities is available in Annex 4.

	2.3: Gender sensitive business models and financial instruments identified	0.45	0.26	Grant	0.19	Grants	MOF
	2.4: Local technicians trained on O&M of SWP and irrigation systems	0.30	0.18	Grants	0.12	Grants	MOF
	2.5: Knowledge sharing and coordination platform established	0.25	0.17	Grants	0.07	Grants	MOF
Project Management Costs							
	National ministry staff and consultants	0.62	0.29	Grants	0.33	Grants	MOF
	Regional and Woreda project staff (salary for project staff in two regional states and 23 woredas	1.04	0.49	Grants	0.55	Grants	MOF
	Utilities and service charges	0.24	0.11	Grants	0.12	Grants	MOF
	Transportation and communications (for two regional bureaus, 23 woredas for the duration of the project)	0.57	0.27	Grants	0.30	Grants	MOF
	Gender Action Plan	0.35	0.17	Grants	0.17	Grants	MOF
	Monitoring and Evaluation (M&E) (except interim and final evaluations,	1.08	0.41	Grants	0.67	Grants	MOF

Indicative total cost (USD)	49,982,775	44,994,677	4,988,098

Note:
Numbers in the table may not add up due to rounding. Detailed cost estimates per well are available in Annex 10 of the Feasibility Study.

C.3 Capacity building and technology development/transfer (max. 250 words, approximately 0.5 page)

C.3.1 Does GCF funding finance capacity building activities?	Yes ☒ No ☐
C.3.2. Does GCF funding finance technology development/transfer?	Yes ☒ No ☐

Transferring innovative climate technology solutions for solar water pumping in drought vulnerable rural areas is at the heart of this proposed project intervention. Even diesel-powered irrigation is rare in Ethiopia, hence, accelerating the deployment of SWP is a key opportunity for leapfrogging that is fully aligned with national priorities defined in the NDC and 10YDP. SWP is a critical technology that can help rural Ethiopian communities adapt to the adverse impacts of climate change by enhancing drought-resilience while mitigation GHG emissions. The quality of transferred technology will be ensured through the development of relevant standards and other measures, local content will be considered where feasible.

The project seeks to achieve the transfer of this climate technology with a combination of demonstrating the practical viability of SWP in two different intervention areas, focused on different agricultural practices (crop production in Amhara, livestock in Borena) in order to maximise the impact. the GCF support provided in Component 2 will also significantly improve various aspects of the enabling environment (regulatory, capacity, financial instruments, digitalization etc) in the country so that technology transfer will be accelerated even beyond the scope of the GCF project boundary.

This project incorporates advanced digital monitoring systems to measure and record the physiochemical properties and volume of extracted groundwater. This data will be instrumental in:
1. Monitoring groundwater table fluctuations
2. Tracking changes in water's physical and chemical composition
3. Analyzing groundwater flow dynamics
4. Ensuring sustainable extraction practices

Budget has been allocated for comprehensive capacity building initiatives, including:

1. Collaborating with institutions such as the Faculty of Technology at the Addis Ababa University and the Ethiopia#+n Water Technology Institute (EWTI) to conduct specialized training workshops.
2. Facilitating knowledge transfer through hands-on experience, where national staff and consultants will work alongside international experts in designing efficient irrigation systems.

Additionally, the project will implement digital payment systems to ensure fair and transparent water use billing. These integrated digital solutions and capacity-building efforts are designed to enhance sustainable groundwater resource management and improve our predictive capabilities through more comprehensive water balance data.

Hence, both financial and technical support for SWP technology transfer will be provided as follows:

Activity 1.1: Submersible pumps and solar PV: The practical implementation of SWP systems in two intervention areas will be supported with USD 8,102,867 (7,397,355.36 USD from GCF).

Activity 2.1-5, Quality Assurance II: Capacity development in support of the enabling environment piloting will be provided with USD 2,715,000.00 (1,905,000.00 USD from GCF).

D

EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

This section refers to the performance of the project/programme against the investment criteria as set out in the GCF's Initial Investment Framework.

D.1. Impact potential (max. 500 words, approximately 1 page)

Adaptation impacts[59]

223. **Direct and indirect number of beneficiaries (disaggregated by gender):** The project will benefit 355,236 people directly and 1,757,752 people indirectly, making a total number of beneficiaries of 2,112,987 individuals. This corresponds to 472,439 (predominantly rural) households[60], or 1.8% of the total population in Ethiopia.[61] The share of female beneficiaries is expected to be at least 50%. Direct beneficiaries are defined as households that receive an adaptation benefit of with access to clean and sustainable water for irrigation, livestock production and potable purposes based on the climate change risks experienced in the project target locations. The indirect beneficiaries benefit from, for instance, increased employment opportunities and additional water availability due to efficient water use in the targeted project areas and increased employment opportunities. Over 200 individuals (community members and technical experts) will be trained. A detailed overview of the beneficiaries' quantification including the expected adaptation benefits and details on avoiding double counting is provided in Annex 22: Adaptation beneficiaries based on the guidance in the GCF Results Handbook.

224. **Assets produced and strengthened:** The project will rehabilitate at least 100 already drilled boreholes and equip them with climate-resilient and emissions-neutral pumping systems powered by solar PV (60 are in Kobo-Girana, 40 are in the pastoralist-dominated Borena zone).

225. **Climate-resilient, diversified and sustainable agricultural production:** The project particularly supports farmers that use agro-ecology and traditional (indigenous) knowledge to use water for productive purposes. For instance, this includes support to traditional pastoralist communities in Oromia that live as nomads crossing borders between Ethiopia and adjacent Kenya. This also includes specific support for farmers that engage in modern climate-smart agricultural techniques, including agro-ecology and permaculture.

226. **Government and local co-operative staff trained in SWP use, climate resilience and governance:** This impact indicator will result from the 'enabling environment' component, including a vocational training program on SWP irrigation systems implemented with regional bureaus to ensure the long-term efficiency and operation of the renewable energy and irrigation technology.

227. **NDC alignment:** The project will contribute to achieving Ethiopia's adaptation targets formulated in its updated NDC and National Adaptation Plan (NAP) by 2030. In the water sector, these targets notably comprise:[62]
   a. *Improve access to potable water to strengthen community climate resilience (p. 35)*
   b. *Expand the construction of medium- and large-scale irrigation systems to ensure food security (p. 35)*

Mitigation impacts

228. **Reducing CO_2 emissions**: Mitigation potentials are calculated using the Clean Development Mechanism's (CDM) methodology AMS-I.B Version 12 comparing the project scenario against a reference case where groundwater is pumped using conventional diesel pumps.[63] The direct overall GHG emission reduction potential of the project is at least **173,220** tCO_2e over the asset lifetime of 20 years (or an annual reduction potential of 6,929 tCO_2e). An additional indirect mitigation impact exists through upscaling and replication of the project that will occur outside the assessment boundary for this mitigation potential estimate.[64]

229. **NDC alignment**: The Ethiopian updated NDC foresees a conditional mitigation target in the energy sector of an annual reduction 4 Mt CO_2 by 2025. This action directly contributes to the broader mitigation targets formulated under the

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[59] Compare core impacts to indicators, data sources and collection tools that are introduced as part of the M&E plan.

[60] The average household size in Ethiopia is 4.6 and has remained the same for the period 2011 – 2016, Central Statistical Agency (CSA) [Ethiopia] and ICF. 2016. Ethiopia Demographic and Health Survey 2016.

[61] The United Nations Population Fund reports a total population estimate for 2022 in Ethiopia with 120.8 million inhabitants.

[62] See Ethiopia's updated nationally determined contribution here and its national adaptation plan here.

[63] "Mechanical energy for the user with or without electrical energy".

[64] See all calculations for the mitigation potential estimates in Annex 22.

updated NDC by lowering Ethiopia's annual emissions by an average of 6,929 tCO_2e each year, noting that the dominant impact is on adaptation.

D.2. Paradigm shift potential (max. 500 words, approximately 1 page)

230. The project interventions seek to address barriers that have prevented the uptake of SWP, leaving rural communities without access to safe water for household use and irrigation. The project thus enhances the resilience of agricultural productivity in increasingly drought-prone areas of rural Ethiopia through promoting SWP in a holistic approach that integrates access to finance with a significantly strengthened enabling environment. These interventions aim at contributing to the overall goal of enabling market penetration of SWP technology well beyond the GCF investment, as SWP has not yet been used in Ethiopia at this scale even though it has the potential to address existential needs of the most vulnerable segments of the population. Economies of scale will be accelerated through this project, making SWP gradually more affordable in Ethiopia. Pioneering SWP for sustainable ground water extraction leads to awareness raising by demonstrating the benefits of the technology in Ethiopia (component 1). While this new technology for Ethiopia requires public investment at this early stage of market penetration, the programme will achieve comprehensive improvements to the national enabling environment for SWP that incentives only the most efficient and sustainable technology, complemented by policy and regulatory measures (tariffs, taxation), access to finance, digitalization, capacity building and knowledge sharing all contribute to enabling much deeper market penetration of SWP beyond the GCF investment. Building on a longstanding focus on community-led development approaches in Ethiopian climate and development policy, this project will demonstrate a first-of-its-kind community-led SWP implementation approach involving Irrigation User Associations (IUAs) and Water User Associations (WUAs), as well as RUSACCOs. This pioneering approach enables local wealth creation and participatory decision-making on operations and maintenance issues. This solar-based irrigation approach in which previously rainfed agriculture was practiced creates a meaningful contribution to the GoE's 2030 target of scaling modern irrigation from 2 to 20% of agricultural areas by 2030.[65]Expanding the use of climate-resilient access to water and the use of modern irrigation technology will lead to increased productivity and income levels in rural households in the two intervention areas. The governance design and accompanying regulation ensure sustainable groundwater abstraction and sustainable use practices e.g. by conducting groundwater balance studies to determine sustainability, assessing water availability, and implementing efficient irrigation systems which will continuously and transparently be monitored using smart meters. These improvements enhance the ability of rural households organized in IUAs to pay for modern water pumping technologies, and attract private sector interest for scaling up in other areas, further aided by comprehensive regulatory improvements described below.

231. While actual deployment of SWP technology in component 1 will contribute to raising awareness by demonstrating benefits for local communities directly, the strengthened enabling environment will contribute in particular to the overall goal of a paradigm shift towards a wide-spread uptake of SWP technology across Ethiopia, well beyond the GCF investment and aligned with NDC targets. Medium to long term benefits and contributions of the strengthened enabling environment to a nation-wide paradigm shift include in particular:

- Activity 2.1 targets the policy and regulatory framework that lays the foundation for shifting towards carbon-neutral, sustainable, and inclusive water provisioning systems. This focuses on regulatory aspects in support of the community-driven approach based on IUA/WUAs for the sustainable and fair management of water resources, tariff structures and technical and operational standards (e.g., to establish and enforce clear technical standards for submersible pumps and PV systems, as well as operational procedures for their implementation), but also governance arrangements;
- Activity 2.2 supports the paradigm shift through enhancing adoption of digital technologies for water metering and payment systems. Water use will be measured through smart meters which can prevent overuse of water resources and keep abstraction rates within the estimated groundwater balance (please refer to annexed under 4 in the feasibility study (Annex 2) that provides a detailed synthesis of the recharge potential of groundwater), a function of groundwater stock and flow elements in sub-basins. Such transparency and data availability presents a novelty in Ethiopia that raises awareness, incentivizes efficiency of water usage, and sparks behavioral changes with regards to utilizing scarce water resources.
- Activity 2.3 helps accelerate shifting towards more inclusive water provisioning systems by supporting women and gender-sensitive business models and financial instruments, i.e., considering gender dimensions in different forms of local agricultural production, including at household subsistence level, small-scale commercial and larger-scale commercial farming. Financing mechanisms that are fit for purpose are crucial for further upscaling of SWP market penetration and acceptance by local beneficiaries.
- Activity 2.4 supports the paradigm shift by training and vocational programs for local and regional staff, including technicians to maintain and operate SWP and irrigation systems, state officials at different levels of governance to raise awareness of community-driven governance models and farmers, that may require training in the

[65] Federal Democratic Republic of Ethiopia, Planning and Development Commission (2021), Ten Years Development Plan. A Pathway to Prosperity 2021-2030. Source: https://www.mopd.gov.et

appropriate deployment and use of SWPs and related irrigation systems. This interplay of practical implementation, access to finance and technical assistance will aim at establishing a national ecosystem of service providers/experts that help this technology to fully establish itself in Ethiopia.

- Activity 2.5 supports the paradigm shift objective through learning and knowledge sharing beyond the project intervention sites, through a targeted knowledge-sharing and coordination platform. The holistic approach considers the need for knowledge management and dissemination in order to leverage synergies within and beyond the (semi)arid regions of Ethiopia as the key long-term outcome.

All these components intend to prepare the ground for further replication and upscaling in a sustainable manner as is illustrated and summarized in Table 1.

Table 1 Paradigm shift dimensions for solar water pumping in Ethiopia

Assessment Dimension	**Current State (baseline)**		**Potential target scenario**	**GCF programme contribution**
	Description	**Rating**		
Scale	80% of Ethiopia's population is working in agriculture. Only 5% of Ethiopia's farmer have access to irrigation, which is predominantly powered by diesel generators. SWP has only very recently entered Ethiopia through Adaptation Fund, AfDB, philantrophy.	Low	GCF finance will enable MoIL to demonstrate the benefits of SWP by deploying the technology in 100 sites in two intervention areas (average pump size Kobo Girana/Amhara 79.8 kw, Borena/Oromia 37 kw). Combined with capacity building, and measures to strengthen the enabling environment, the GCF programme seeks to catalyze a market for SWP that will support Ethiopia to reach NDC / NAP targets	The GCF intervention will provide much-needed finance as well as address non-monetary barriers for SWP in Ethiopia. This will result in a significant increase of SWP that delivers environmental, social benefits, e.g. - Water supply - Mitigation - Community resilience - Job creation - Capacity building and training - Improved regulatory environment
Replicability	Although SWP is a mature technology that has been used widely in industrialized countries, and increasingly in the region, barriers described above have prevented a stronger uptake of SWP for irrigation and potable water. There is also an insufficient awareness and consumer confidence, as well as readily available access to finance for SWP technology, which prevents a stronger market penetration	Low	Strengthened enabling environment and confidence in SWP by demonstrating its benefits, alongside increased technical capacity and availability of financial instruments will lead to replication of the programme intervention across the country. Ethiopia has the potential to irrigate 16% of land through SWP. Once awareness and enabling environment have been improved, increased demand will initially be supported by further climate finance initiatives (e.g. carbon finance denominated in forex through Ethiopia's offgrid electrification carbon market programme at Development Bank of Ethiopia with World Bank support), but increasingly driven by the private sector, at least for commercial agriculture.	The GCF intervention will generate a demonstration effect for the benefits of SWP, and through technical assistance also substantially improve the enabling environment (institutional capacity, regulatory, access to finance, etc) for SWP deployment beyond the intervention areas across Ethiopia. Improved knowledge and capacity will support further domestic and international finance mobilization and investments.

D

Sustainability	While renewable energy in off-grid areas is becoming more established, productive use such as SWP is still completely new in Ethiopia. Cost-reflective and gender-sensitive business models for SWP have not yet been established in Ethiopia, but will be demonstrated through this project.	Low	The significantly improved enabling environment, demonstration of the benefits of SWP (stronger community resilience, increased agricultural yields), and improved access to finance will lead to an expansion of the SWP market, aided by decreasing technology costs and profitable business models (e.g. ability to market increased yields) which also generate climate and sustainable development benefits that support further climate finance mobilization (e.g. from IFIs, but also potentially results-based carbon finance).	Key project outputs that will remain relevant beyond the GCF investment include all elements of component 2 enabling environment (policy and regulation, digitalization, gender-sensitive business models and financial instruments, capacity building and training, learning and knowledge management)

D.3. Sustainable development (max. 500 words, approximately 1 page)

Sustainable development goals (SDG) contributions:

SDG1: No poverty	SDG2: Zero hunger	SDG6: Clean water and sanitation
SDG7: Affordable and clean energy	SDG8: Decent work and economic growth	SDG10: Reduced inequalities
SDG13: Climate Action		

232. Water is the basis for life on Earth – enabling sustainable access to clean water for drinking and sanitation (SDG6) is recognized as having direct impacts on sectors such as agriculture, health, and industry and therefore on broader socio-economic development. Overall, while Ethiopia made some progress with equipping households with access to improved drinking water and sanitation services, the gap to universal access to to clean drinking water remains at with 32.2% in on average and at least 40% in rural areas large. If sustainable access to water for productive purposes in the agricultural sector is added, this gap increases, especially in the context of climate change (see section B.1). The project directly contributes to closing this gap in the most vulnerable areas in Southwestern Oromia and Northwestern Amhara regions.

233. Similarly, SDG7, affordable and clean energy, is also deemed an essential service with cross-cutting impacts on the achievement of other SDGs. However, at the end of 2019/20, only 44% of Ethiopia's population had access to electricity, of which 33% to on-grid and 11% to off-grid solutions. While nearly all electricity generation in Ethiopia comes from renewable sources, especially hydropower, Ethiopia has the second largest energy access deficit in Sub-Saharan Africa which is why the expansion of solar energy and other renewable sources is a high policy priority for Ethiopia. The project directly contributes to this policy priority by providing both the investments in solar electricity generation as well as enabling environment support aimed at scaling up SWP technology within and beyond Ethiopia.

Environmental co-benefits

234. Environmental co-benefits will be achieved, as described in section D.1 (adaptation and mitigation potentials).

Social and health-related co-benefits

Social Benefits:

235. The project will generate employment opportunities throughout its implementation, particularly during the installation, operation, and maintenance of solar water pumping (SWP) systems. By engaging local technicians, community members, and cooperatives, the project will provide a stable source of income, fostering economic stability within the community. Training programs on gender-sensitive business models and financial literacy are integral to the project, aiming to empower women and marginalized groups. This initiative will promote

gender equality and economic inclusion, ensuring that the benefits of the project are widely shared among all community members.

236. Furthermore, the project will improve livelihoods by enhancing agricultural productivity through reliable irrigation. This improvement will enable farmers to cultivate a wider variety of crops throughout the year, thereby reducing their vulnerability to droughts and erratic rainfall. The increased agricultural productivity will lead to higher crop yields and improved food security, which are crucial for sustaining the community's economic resilience. Improved water access will also enable communities to diversify their income sources, engaging in activities such as horticulture, livestock rearing, and small-scale agribusinesses. This diversification will further strengthen the economic resilience of the communities.

237. In addition to these economic benefits, the project will strengthen community cohesion by fostering collaborative efforts among community members, cooperatives, and local institutions. Training and capacity-building initiatives will enhance local governance structures and decision-making processes, ensuring the active participation and empowerment of all community members. Workshops and training sessions for Irrigation Users Associations (IUAs), Rural Savings and Credit Cooperatives (RUSACCOs), and local communities will promote best practices in water management, financial literacy, and sustainable agriculture. This comprehensive approach ensures that the benefits of the project extend beyond immediate economic gains to foster long-term community development and resilience.

Health Benefits:

238. Access to safe and reliable water sources is fundamental to improving public health outcomes. The project will provide clean and reliable water sources for drinking, significantly reducing the reliance on contaminated surface water and the incidence of waterborne diseases. Approximately 66,540 households will benefit from improved clean drinking water, contributing to better public health outcomes. By ensuring that communities have access to safe water, the project will help reduce the prevalence of diseases such as diarrhea, cholera, and dysentery, which are commonly associated with unsafe water sources. This reduction in waterborne diseases will result in lower healthcare costs and improved overall health for community members, particularly children and the elderly.

239. Moreover, the project will promote better hygiene practices by providing sufficient water for household use, including handwashing, cooking, and cleaning. Improved sanitation facilities will further contribute to reducing the spread of diseases and enhancing the quality of life within the communities. By addressing the fundamental need for clean water, the project will have a direct and substantial impact on public health, reducing the burden of disease and improving the well-being of the communities.

240. Additionally, the project will reduce air pollution by replacing diesel-powered water pumps with solar-powered systems. This shift will improve air quality and reduce respiratory illnesses associated with indoor air pollution from diesel generators. By mitigating the health risks associated with air pollution, the project will contribute to healthier living environments and improved respiratory health for community members.

Economic co-benefits

241. Reliable water supply reduces disaster-induced loss and/or distress sales of crops and livestock. Introducing SWP enables the community to shift periodic expenses for fuel and maintenance of diesel generators to more productive purposes. There will be direct job opportunities through the management of drinking water and irrigation schemes and related services (e.g., supply of parts, labour and equipment, construction, agro-processing). Improved purchasing power of households in turn drives local economies, leading to further indirect job creation. Farmer aggregation through cooperatives ensure integration into agricultural value chains and green industrialization. On a national level, reduced fuel needs save precious foreign currency.

242. The economic and financial analysis highlights several quantitative benefits that further underscore the value of the project. The cost-benefit analysis (CBA) indicates a positive net present value (NPV) and a benefit-cost ratio (BCR) greater than 1, demonstrating that the economic benefits of the project significantly outweigh its costs.

243. Employment and training are critical components of the project. At least 100 local technicians will be trained in the operation and maintenance of SWP and irrigation systems, ensuring long-term sustainability and local ownership. This training will create skilled job opportunities and contribute to the local economy, providing a foundation for sustained economic growth.

244. Increased agricultural productivity is another key benefit of the project. Reliable irrigation will lead to higher crop yields and more stable food production, directly benefiting around 4,700 farmer households with new or improved irrigation systems. This improvement in agricultural productivity will enhance food security and income stability, providing a buffer against economic shocks and climate variability.

245. The project will also have a significant environmental impact by reducing greenhouse gas emissions. By replacing diesel-powered pumps with solar-powered systems, the project will reduce CO2 emissions by

approximately 173,220 tones over the lifetime of the assets (2024-2043), with 24,250 tones reduced during the project period (2024-2030). This reduction in emissions aligns with Ethiopia's NDC targets and global climate goals, contributing to a cleaner environment and improved public health.

246. Finally, improved water supply for households will have a profound impact on public health. Around 66,540 households will benefit from clean drinking water, significantly reducing the incidence of waterborne diseases and improving health outcomes. This access to safe water is crucial for maintaining public health and well-being, providing a foundation for sustained community development.

Gender-sensitive development impact

247. The project has developed a gender action plan to ensure women's equal opportunities to participate in planning, implementation, monitoring, and evaluation of the project with clearly identified gender-sensitive indicators; building the resilience of female-headed households and women in male-headed households; and alleviating conditions that have adverse consequences on the health and safety of women in the project area. Furthermore, this project will revise existing manuals, frameworks, plans and institutional architecture at the Woreda level to be more gender responsive.[66] Clean water supply comes with numerous benefits, chief amongst them being reduced child mortality but also the health of the entire community. Improved household access to water reduces the burden on women and girls to fetch water, giving them more time for school, childcare and income-producing activities which will unequivocally transform community life.

D.4. Needs of recipient (max. 500 words, approximately 1 page)

248. Ethiopia is a large, landlocked, and culturally highly diverse country that ranks only on number 173 out of 189 countries in the United Nations Development Programme (UNDP) 2019 Human Development Index.[67] As an LDC, Ethiopia is an eligible borrowing country for listed by the International Development Association (IDA) [68]. Furthermore, this status stipulates special treatment under the UNFCCC[69] and the Paris Agreement[70].

249. Where irrigation is practiced, water is pumped using emissions-intensive and - with soaring fuel prices - increasingly unaffordable diesel generators[71], especially in remote rural areas where only 16% of households are connected to the electricity grid.[72] Solar water pumping is not widely used due to financial constraints and lack of experience.[73] 85% of the rural population do not have access to safe water for drinking and sanitation.[74] People continue to rely heavily on surface water sources - which are vulnerable to climate impacts and prone to water-borne diseases. Climate impacts on water supply therefore negatively affect agricultural productivity and food security, drinking water, nutrition and health. They also disproportionately affect women and children.

250. The access to clean drinking water varies between and within regions but robust and spatially disaggregated data is scarce. In 2019/20 about 28% of rural households spend 30 minutes or longer to fetch drinking water (round trip).[75] The feasibility study finds that while in the Kobo Girana target area in the Amhara region nearly all drinking water needs are satisfied, the pastoralist-dominated and more arid Borena zone in the Oromia region is strongly in need of expanding drinking water provisioning systems (see Annex 2). In the latter, close to 49,000 rural households can be supplied with first or better access to this basic needs infrastructure, improving the quality of life of close to 230,000 individuals. Indeed, accelerating universal access to water and sanitation to increase climate resilience by shifting people from using exposed surface water sources to more resilient sources is a key GoE priority that benefits the most vulnerable populations.[76]

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66 SMIS (n.d.): Small and Micro Irrigation Support (SMIS) Project Ethiopia, https://www.ssi-km.online/index.php/smis-project/ (accessed July 26, 2022)

67 UNDP (2020): Human Development Report 2020, The Next Frontier: Human Development and the Anthropocene, Ethiopia country brief, https://hdr.undp.org/sites/default/files/Country-Profiles/ETH.pdf (accessed July 28th, 2022)

68 https://ida.worldbank.org/en/about/borrowing-countries

69 UNFCCC (2009): Least Developed Countries under the UNFCCC, https://unfccc.int/resource/docs/publications/ldc_brochure2009.pdf (accessed July 28th, 2022)

70 Pauw et al. (2019): Subtle differentiation of countries' responsibilities under the Paris Agreement, in: Nature, 86

71 International Water Management Institute (IWMI) (2018): Business Model Scenarios and Suitability: Smallholder Solar Pump-based Irrigation in Ethiopia, International Water Management Institute, Colombo

72 Federal Democratic Republic of Ethiopia (2019): National Electrification Program 2.0 Integrated Planning for Universal Access, Addis Ababa

73 International Water Management Institute (IWMI) (2018): Business Model Scenarios and Suitability: Smallholder Solar Pump-based Irrigation in Ethiopia, International Water Management Institute, Colombo

74 UNICEF (2019): Gender and equity issues in the Water, sanitation, and hygiene (WASH) programme - Ethiopia, UNICEF

75 Federal Democratic Republic of Ethiopia (2022): Ethiopia Voluntary National Review 2022, Ministry of Planning and Development, Addis Abeba

76 Federal Democratic Republic of Ethiopia (2021): Ethiopia 2030: The Pathway to Prosperity:
Ten Years Perspective Development Plan (2021 – 2030), https://phe-ethiopia.org/wp-content/uploads/2021/04/10_year_plan_english_final.pdf (accessed Julty 26, 2022)

251. Next to physical needs, the main problem is a significant private and public funding gap (Annex 2 and section B.5). This is fulled by high population growth which partially offsets gains made to improve rural livelihoods regarding food security, health, and education. The need to support the selected intervention areas is further underpinned by the high vulnerability to climate impacts (see Annex 2) and their effect on gender inequality in Ethiopia (see Annex 8).

252. Furthermore, Ethiopia's precarious economic and environmental situation underscores the urgent need for comprehensive support. With ongoing droughts undermining livelihoods and food security, migration and food aid dependency have surged. The Belg agricultural season faces a 16% reduction in suitable areas, intensifying food insecurity. Water-related conflicts are rising, with the country experiencing at least one hunger season annually. Electricity, generated entirely from diesel for water pumping, remains inaccessible to 70% of the population. Ethiopia ranks fifth globally in drought risk and faces substantial flooding risks, coupled with moderate to very low coping and adaptation capacities. Pastoral areas, located in deserts and semi-arid zones, suffer from significant rainfall deficits. The heavy reliance on hydropower, vulnerable to climate fluctuations, further exacerbates these issues. Economic strains are severe, with 70% of the population living on less than $2 per day, 35% inflation driving a 60% surge in food basket costs, and macroeconomic instability from high external debt and currency depreciation. Climate change's economic impacts result in a 10% GDP loss. High capital costs, hedging risks, and lack of domestic bank financing for non-commercial activities, along with the necessity of foreign currency for solar systems, add to Ethiopia's financial burdens, highlighting the critical need for targeted international support

253. As a result of the above, the GCF interventions shall be used to overcome key barriers as noted in the theory of change (e.g., access to finance, technical capacity, awareness) to promote SWP and enhance climate-resilient access to safe water in the identified most vulnerable regions.

D.5. Country ownership (max. 500 words, approximately 1 page)

254. The interventions are fully in line with the priorities of Ethiopia's updated NDC, 10YDP and key GoE sectoral priorities. The National Adaptation Plan – Ethiopia (NAP-ETH) identifies access to safe drinking water and enhanced agricultural productivity through modern irrigation as key priorities. The feasibility study for this project dedicates an entire chapter to directly related and adjacent policies relevant for introducing SWP technology in Ethiopia (Annex 2).

255. Ethiopia's updated NDC prioritizes adaptation in its vision of becoming a climate-resilient middle-income country by 2025. NAP-ETH (2016-2030) accordingly aims to increase resilience by **enhancing food security by improving agricultural productivity in a climate smart manner** as well as **improving access to potable water,** particularly in drought prone areas.[77] The plan focuses on enhancing water availability using small-scale wind and solar pumps and improving agriculture production and marketing through enhancing resilience of value chains for livestock, crops, and products from other sectors. The overall cost of NAP-ETH is estimated to be USD 90 billion, i.e., USD 6 billion per annum. GoE envisages mobilizing the required climate finance from domestic, including public and private sources, and global adaptation finance sources. Ethiopia's updated NDC also prioritizes actions such as expansion of irrigation services operated with clean energy.[78]

256. The GoE recognizes the threats of climate impacts for agriculture and water security and has articulated ambitious resilience and mitigation strategies in its CRGE and the updated NDC. The CRGE was already fully mainstreamed with comprehensive and concrete targets and measures in Ethiopia's previous five-year GTPs. The new flagship 10YDP formulates new targets for all sectors until 2030, including the priority target of freeing agriculture from rain dependance to improve income and livelihood options for farmers and pastoralist communities.[79] MOWE has formulated a climate resilience strategy for water, irrigation, and energy, which mentions groundwater-based irrigation as a future priority that has so far remained largely untapped.[80] Similarly, related efforts such as Ethiopia's multi-sector investment plan, developed with support from the Pilot Programme for Climate Resilience, also prioritize access to irrigation, safe water, and sustainable energy[81] (for more info, please

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[77] Federal Democratic Republic of Ethiopia (2019a): Ethiopia's climate resilient green economy: National adaptation plan, Addis Ababa

[78] Federal Democratic Republic of Ethiopia (2021): Updated Nationally Determined Contribution, https://unfccc.int/sites/default/files/NDC/2022-06/Ethiopia%27s%20updated%20NDC%20JULY%202021%20Submission.pdf (accessed Julty 26, 2022)

[79] Federal Democratic Republic of Ethiopia (2021): Ethiopia 2030: The Pathway to Prosperity: Ten Years Perspective Development Plan (2021 – 2030), https://phe-ethiopia.org/wp-content/uploads/2021/04/10_year_plan_english_final.pdf (accessed Julty 26, 2022)

[80] Worqlul, Abeyou; Jeong, Jaehak; Dile, Yihun; Osorio, Javier; Schmitter, Petra; Gerik, Thomas; Srinivasan, R; Clark, Neville (2017): Assessing potential land suitable for surface irrigation using groundwater in Ethiopia, in: Applied Geography, 85, p. 1-13

[81] FAO (2015): FAOLEX Database, https://www.fao.org/faolex/results/details/en/c/LEX-FAOC205047/ (accessed Julty 26, 2022)

see section B.2.4/Annex 1). Ethiopia has also developed an irrigation development and expansion strategy and approach.

257. As part of these resilience strategies, GoE has set out targets for universal access to safe water, increasing smallholder farmers' productivity, and access to electricity as key levers to build the adaptive capacity of rural communities. These goals set a minimum service level of 25 liters per capita per day (l/c/day) within 1 km from the water delivery point for 85% of the rural population, 20% of whom are reached by a piped system.[82] The resilience and productivity of crop and livestock can be enhanced by supporting strategic crops and livestock breeds with modern irrigation infrastructure as well as increased market linkages.[83] Overall, more than 16 million smallholder farmers are to be supported with resilient water access.

258. The ministry with full ownership of implementing the proposed project as executing entity is MoIL, in close cooperation with other line ministries such as MOWE and regional water and energy bureaus. MoIL is currently working on a National Irrigation Program that will consider this proposed GCF-funded a key priority. This will enhance their capacity to providing financing for the water sector, deploying SWP and supporting local communities. The program also recognizes the need to introduce a large-scale National Irrigation Fund as seen in other countries for infrastructure or irrigation financing to address potential budget shortfalls for smallholder irrigation, scale and or replication of successful projects, support standardization of prioritization of financing for schemes, and facilitate increased consistency and learning across regions, to replicate the success of the small-scale irrigation component of the Agricultural Growth Program funded by the World Bank.

259. The National Irrigation Fund which will potentially be structured as a public-private partnership with a multistakeholder governance structure, managed by a financial institution (Development Bank of Ethiopia) and contributions from IUA's, government and development partners both in terms of funding and technical support. The fund will be established to ensure consistent prioritization of investments through the application of standard criteria, consistent planning and design of schemes, and adherence to various best practices.

260. MoPD as the NDA fully supports this project and is co-leading the CRGE Facility as a key executing entity. The MoPD will also be involved in integrating the project results/impact into national MRV processes related to the 10YDP, NDC, and SDG.

261. During GTP II, the government of Ethiopia has identified 176 sites which equal over 5 million ha to be irrigated at medium and large scale across the country. However, 95% of the planned irrigation projects focus on utilization of surface water, which are more vulnerable to climate impacts than groundwater.[84] The CRGE underlines the importance of country's groundwater potential and envisions a detailed assessment on the vulnerability of groundwater-based irrigation schemes.[85] First pilot projects using solar water pumping by MOWE in 49 sites have supplied 130,000 rural beneficiaries with access to safe water. The CRGE Facility has implemented a pilot activity on solar water pumping in 2016.

D.6. Efficiency and effectiveness (max`. 500 words, approximately 1 page)

262. Ethiopia is an LDC with a challenging fiscal situation, high debt vulnerability (risk of external debt distress), limited budgetary resources and significant local currency risk, as well as high vulnerability to negative climate change impacts. In the absence of public or private investment, supporting the supply of basic needs such as potable water and irrigation infrastructure for climate-resilient water access through non-repayable grants is well-justified and a matter of climate justice (see section B.5 for detailed justification of funding request). Given Ethiopia's challenging context described above, the financial structure of this intervention requires 100% grant allocation (USD 45 million GCF financing, USD 5 million GoE co-financing) especially due to the high upfront capital cost of this cross-cutting (but adaptation-focused) project. The following paragraphs shall further support the adequacy of the type and volume of financing requested. The overall effectiveness of the requested funding is elaborated by type of outcome objective (mitigation / adaptation) in Table 4 (CAPEX only). Moreover, the

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[82] Federal Democratic Republic of Ethiopia (2016): Growth and Transformation Plan II (GTP II) (2015/16-2019/20), Volume I: Main Text, Addis Ababa

[83] Federal Democratic Republic of Ethiopia (2016): Growth and Transformation Plan II (GTP II) (2015/16-2019/20), Volume I: Main Text, Addis Ababa

[84] Worqlul, Abeyou; Jeong, Jaehak; Dile, Yihun; Osorio, Javier; Schmitter, Petra; Gerik, Thomas; Srinivasan, R; Clark, Neville (2017): Assessing potential land suitable for surface irrigation using groundwater in Ethiopia, in: Applied Geography, 85, p. 1-13

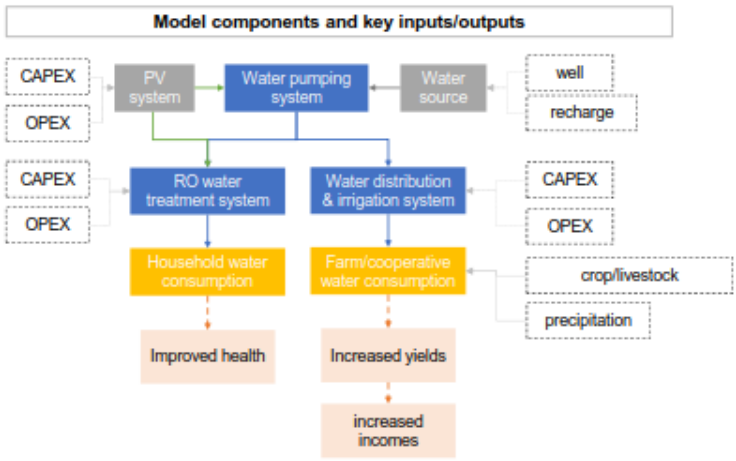
[85] Federal Democratic Republic of Ethiopia (n.d.): Ethiopia's climate-resilient green economy climate resilience strategy: Water and energy, Addis Ababa

effectiveness and efficiency of the GCF investment is demonstrated by a comprehensive economic and financial analysis, which is referenced below and separately presented as Annex 3 to this funding proposal.

Table 4: Effectiveness of requested funding.

	Requested funding (USD million)	Efficiency (ratio)	Comment
Adaptation	42.50	*Average CAPEX cost per rehabilitated well* **USD 7,7458.99** (7,745,898.53/100)	Estimate considers all capital goods, including pumping, power and irrigation systems (see Annex 10 of the Feasibility Study for a site-specific breakdown of CAPEX costs). Excludes 3% contingency reserve.
		Average CAPEX cost per direct beneficiary households (potable and productive uses) **USD $645 per Household** (42,485,358.72 /355,235)	See detailed CAPEX cost estimates in Annex 10 of the Feasibility Study as well as Annex 3 (Financial Model). It is estimated that 71,047 predominantly rural households will directly benefit from the project.
		Average CAPEX cost per beneficiary household (direct and indirect) **USD 100**	It is estimated that 355,236 predominantly rural households will benefit from the project.
Mitigation	7.5	*Cost per ton CO_2e* **USD 44** (including co-finance)	Considering submersible pumps, solar PV modules and related equipment only (see Annex 10 of the Feasibility Study for a site-specific breakdown). Calculated over estimated lifetime emission reductions of assets (see Annex 22).

263. Moreover, the effectiveness and efficiency of the GCF investment is demonstrated by a comprehensive economic and financial analysis, which is summarized below and separately presented as Annex 3 to this funding proposal. The overall economic and financial analysis is based on a model which complements this funding proposal in Annex 3. The overall set-up of the financial model is designed as follows:



Source: 1 Annex 3, cover page

264. The goal of the project design is to provide sustainable access to safe water services at an affordable costs to these fragile communities. The financial analysis of return on investment clearly shows that the GCF grant cannot be recovered unless water tariffs as the key revenue stream would be substantially increased to the detriment of local communities. Still, a financial analysis was performed to assess the viability of recovering the GCF and GoE investments, which show clearly show negative FIRR for the two intervention areas, at -11% (Kobo Girana, Cluster 1) and -14% (Borena, Cluster 2) (see Annex 2, Sheet: Summary, l27).

265. This analysis also clearly demonstrates that substituting grants with concessional loans in part or in full is not viable, since any additional interest payments would negatively impact the FIRR, which would then be even more negative. Moreover, Ethiopia is already in debt distress, which would should not be further amplified for

an intervention that clearly aims at delivering public good services for vulnerable rural communities rather than maximizing profits for private companies.

266. The water tariffs have been tentatively modelled. The GoE has the prerogative to potentially set tariffs differently based on updated data and information at the start of project implementation and the tariffs possibly could be lower if there was a larger working capital allocation. The EFA model as it stands will serve as a tool that can be utilized ahead of and during project implementation to inform policy decisions such as determining tariff levels and other relevant parameters.

267. This approach prioritizes maximizing economic benefits for households, by setting water tariff levels at a level that is cost-reflective, but does not generate financial profit for any stakeholder beyond the economic benefits of rural households, primarily through increased agricultural productivity, which in turn positively influences farmers and households' abilities to pay for water provision so as to develop a scalable approach that ensures equitable water access for all.[86] The two tables below demonstrate the positive broader economic benefits of the GCF-supported intervention for all 71,047 households, presented separately by intervention area as well as aggregated. Moreover, additional economic benefits such as GHG emission reductions in addition to health benefits will be generated. This table describes socio-economic impacts per at the beneficiary level, which clearly demonstrates that the overall economic benefits clearly exceed the investments made.

Table 6 Socio-economic impacts, average and total results

Socio-economic impact	Selected site	Average / site	Kobo Girana	Borena	Total project
Total households	1,505	710	4,507	66,540	71,047
Total beneficiaries	7,524	8,523	22,535	332,701	355,236
Total water supply (m3)	2,876,872	3,906.311	267,115,669	123,515,459	390,631,128
Total net economic benefit per household (project lifetime, in $)	13,087	53,225	90,669	15,781	53.225
Total net economic benefit per household (per year, in $)	654	2,661	4,533	789	2.661

Source: Annex 3, Summary

Table 7 Summary Economic Analysis – Annual

Period		Y1	Y2	Y3	Y4	Y5	Y6	Y7
Cluster 1 - Kobo Girana								
Baseline income / HH	USD	1.828	1.669	1.524	1.392	1.271	1.160	1.059
Projected income / HH	USD	5.668	8.681	11.127	10.334	9.599	8.916	8.283
Net economic benefit / HH	USD	3.840	7.011	9.602	8.943	8.328	7.756	7.223
Project CAPEX	USD	-27.930.272						
Project OPEX (already deducted through the water tariff)	USD	-690.570	-1.205.720	-1.207.745	-1.599.771	-2.133.515	-2.079.931	-2.031.178
NPV of investment (20 years, @11%)	USD	138.386.288						
Cluster 2 - Borena								
Baseline income / HH	USD	4.248	3,835	3,463	3.127	2.823	2.549	2.302
Projected income / HH	USD	4.673	4.654	4,604	4.223	3.874	3.554	3.260
Net economic benefit / HH	USD	425	819	1,141	1.096	1.050	1.004	959
Project CAPEX	USD	-12.373.257						
Project OPEX (already deducted through the water tariff)	USD	-527.113	-664.400	-659,331	-1.047.304	-1.585.106	-1.555.743	-1.528.846
NPV of investment (20 years, @11%)	USD	139.329.957						

268. In addition, the project delivers broader socio-economic benefits (health, environmental) in particular to benefiting rural households, which would not materialize without the impact of the measures supported by GCF grants. Improved yields improves food security, and particularly in combination with improved access to safe water generates substantial health benefits. These could be expressed in Healthy Life Expectancy (HALE) at birth, which is a quantifiable standard indicator used by the World Health Organisation (WHO). Expected impacts on effects on life expectancy can be approximated based on existing literature, which assume a 1% increase in enhanced access to clean drinking water life expectancy increases by 0.21%, after the intervention (Rahman et al. 2022, study looks at disadvantaged countries including Ethiopia). Related benefits include effects on child mortality where evidence from rural Ethiopia shows that the incidence of child diarrhea was 18 percentage points lower in households with uncontaminated stored drinking water than in households with contaminated water (Usman et al. 2018).

[86] The financial model carries out sensitivity analyses on different agricultural and household water prices. In the baseline scenario, the former is given with p = 1,04 USD / m^3 and the latter with p = 0,19 USD / m^3. For specific IRR estimates per region and month/year, refer to Annex 3.

LOGICAL FRAMEWORK

E.1. Project/Programme Focus

Please indicate whether this proposal is for a mitigation or adaptation project/programme. For cross-cutting proposals, select both.

☒ Reduced emissions (mitigation)

☒ Increased resilience (adaptation)

E.2. GCF Impact level: Paradigm shift potential (max 600 words, approximately 1-2 pages)

Assessment Dimension	Current state (baseline)		Potential target scenario (Description)	How the project/programme will contribute (Description)
	Description	Rating		
Scale	Little to no roll-out of SWP technology for water pumps at scale (rare use of diesel pumps or predominantly no pumps and surface water)	Low	Increased market penetration of emissions-free pumping capacity through a minimum of 100 SWPs added (~4000 kw pump capacity)	Within the scope of the project is the rehabilitation of a minimum of 100 SWPs; as well as the contribution to developing regional and supra-regional standards, frameworks and conditions to disseminate SWP technology within and beyond Ethiopia at scale. This intervention will deploy 8.4MW of SWP capacity, and thus make a major contribution to Ethiopia's 2030 target of scaling modern irrigation from 2% to 20% nationwide by 2030 as per the updated NDC/10Year Development Plan.
Replicability	DREAM project is a smaller but adjacent project that may influence the baseline scenario. This project,	Low	Expansion of the beneficiary base (main beneficiaries: most vulnerable rural smallholder farmers) and of the target regions (Kobo-Girana valley and Borena zone).	Strong contribution of outputs in project component 2 ("enabling environment") to achieving replicability within and beyond Ethiopia.

	which is still in design stage, will operate at 9 sites in Ethiopia.			
Sustainability	No likelihood that, given current budgetary constraints in Ethiopia this, or a similar project, would be implementable or sustainable over time.	Low	Coordinated efforts at multiple levels (local community organizations, regional and federal governments) with regards to organizing and implementing the maintenance and operations of assets after the exit of the GCF.	Key outputs to be sustained after the project period (7 years) are the maintenance and operation of assets, as well as the coordination among state and non-state actors.

E.3. GCF Outcome level: Reduced emissions and increased resilience (IRMF core indicators 1-4, quantitative indicators)

GCF Result Area	IRMF Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions / Note
				Mid-term	Final[87]	
MRA1 Energy generation and access	Core 1: GHG emissions reduced, avoided or removed/sequestered	Water pumps operation records, including operating hours, capacity as in the nameplate, and total electricity produced (MWh). Estimates will follow the requirement from CDM methodology AMS.I.B. version 13	No solar or diesel pumps installed at selected (already drilled) project sites	3,462 CO_2e (end of year 4 from installation)	24,249 CO_2e (after 7 years) 173,200 CO_2e (After end of technology lifetime)	See Annex 22 for all assumptions and parameters

[87] The final target means the target at the end of project/programme implementation period. However, for core indicator 1 (GHG emission reduction), please also provide the target value at the end of the total lifespan period which is defined as the maximum number of years over which the impacts of the investment are expected to be effective.

MRA1 Energy generation and access	Supplementary 1.3: Installed renewable energy capacity (MW)	Total installed capacity of the solar PV that will supply power to the water pumps (nameplates, contracts)	No renewable power installed at selected project sites	4 MW	8.5 MW	It is assumed that all pumps will be installed at the end of year 4. See Annex 22 for all assumptions and parameters
MRA1 Energy generation and access	Supplementary 1.4: Renewable energy generated (MWh)	Water pumps operational records including operating hours, capacity as in the nameplate, and total electricity produced	No renewable electricity is generated and used to run water pumps	4,318 MWh (at the end of year 4)	30,238 MWh (at the end of year 7) 172, 796 MWh (After end of technology lifetime)	See Annex 22 for all assumptions and parameters
ARA1 Most vulnerable people and communities	Core 2: Direct and indirect beneficiaries reached	Total number of individuals whose resilience to climate change has been improved by the activity implementation	No individual is improving the resilience to climate change	845,295 (142,094 (66,784 male and 75,310 female) direct and 727,191 (341,779 male and 385,442 female) indirect) individuals	2,112,987 Individuals (355,235 (174,064 male and 181,171 female) directly and 1,757,752 (878,876 Male and 878,876 female) indirectly)	Direct and indirect beneficiaries. See Annex 22 on adaptation beneficiaries
ARA1 Most vulnerable people and communities	Supplementary 2.1: Beneficiaries (female/male) adopting improved and/or new climate-resilient livelihood options (number of individuals)	Total number of individuals that adopted new climate-resilient livelihood options	No individual is adopting climate resilient livelihood options	177,618 (83,480 male and 94,138 female)individual in both Kobo Girana and Borena	355,235 (174,064 male and 181,171 female) individual in both Kobo Girana and Borena	Direct beneficiaries only. See Annex 22 on adaptation beneficiaries

ARA1 Most vulnerable people and communities	Supplementary 2.3: Beneficiaries (female/male) with more climate-resilient water security	Field observation visits, and where applicable, surveys/questionnaires	Kobo-Girana: no potable water needs; irrigation only (236 drilled boreholes out of which currently 32 are operated with diesel generators) Borena: vast potable water needs with faraway and dysfunctional water collection points (113 drilled boreholes out of which only 13 are currently under operation)	177,618 (83,480 male and 94,138 female)individual in both Kobo Girana and Borena	355,235 (174,064 male and 181,171 female) individual in both Kobo Girana and Borena	Direct beneficiaries only. See Annex 22 on adaptation beneficiaries
ARA2 Health, well-being, food and water security	Supplementary 2.2: Beneficiaries (female/male) with improved food security	Field observation visits, and where applicable, surveys/questionnaires	See ARA1	177,618 (83,480 male and 94,138 female) individual in both Kobo Girana and Borena	355,235 (174,064 male and 181,171 female) individual in both Kobo Girana and Borena	Direct beneficiaries only. See Annex 22 on adaptation beneficiaries

E.4. GCF Outcome level: Enabling environment (IRMF core indicators 5-8 as applicable)					
Core Indicator	**Baseline context (description)**	**Rating for current state (baseline)**	**Target scenario (description)**	**How the project will contribute**	**Coverage**
Core Indicator 5: Degree to which GCF investments contribute to strengthening institutional and regulatory frameworks for low emission climate-resilient development pathways in a country-driven manner	No dedicated policies, technical standards, licensing and regulatory frameworks for groundwater abstraction for SWP roll-out in Ethiopia	low	Dedicated policies, standards or framework strategies for SWP roll-out in Ethiopia contribute to improved enabling environment for implementing and scaling solar water supply systems	Activity 2.1 (regulations, policies and guidelines)	National level (one country)
Core Indicator 6: Degree to which GCF investments contribute to technology deployment, dissemination, development or transfer and innovation	No private or public investments at scale contributing to technology deployment, dissemination, transfer and innovation	low	Public investments at scale that contributes o technology deployment, dissemination, transfer and innovation	Activity 1.1 (technology transfer), Activity 2.2 and 2.3 (innovation) and activity 2.5 (dissemination)	National level (one country)
Core indicator 7: Degree to which GCF Investments contribute to market development/transformation at the sectoral, local, or national level	No public or private investments at scale to develop and transform local and regional food markets supported by smallholder farmers through irrigation systems	low	Development of climate-resilient local and regional food markets with focus on staple foods and cash crops	Activity 1.3 (develop local and regional food systems) and 2.3 (transformation through gender-sensitive and inclusive business models)	National level (one country)
Core indicator 8: Degree to which GCF investments contribute	No effective knowledge sharing, learning and	low	Development of a Knowledge-sharing and		National level (one country)National level (one country)

to effective knowledge generation and learning processes, and use of good practices, methodologies and standards	good practices platform in the context of SWP		coordination platform at the CRGE Facility	Activity 2.5 (effective knowledge sharing)	

E.5. Project/programme specific indicators (project outcomes and outputs)						
Project/programme results (outcomes/ outputs)	**Project/programme specific Indicator**	**Means of Verification (MoV)**	**Baseline**	**Target**		**Assumptions / Note**
				Mid-term	**Final**	
Outcome 1a: Increased resilience and enhanced livelihoods of vulnerable smallholder farmers & pastoralists	• Number of households benefiting from irrigation system and potable water supply	*Data provided by smart meters for water and electricity flows* *Field observation visits*	*0*	177,618 (83,480 male and 94,138 female)individual in both Kobo Girana and Borena	355,235 (174,064 male and 181,171 female) individual in both Kobo Girana and Borena	Direct beneficiaries only. See Annex 22 on adaptation beneficiaries
Outcome 1b: Increased community access to safe water in drought prone regions	*Number and quality of policies, framework strategies and standards introduced*	Key informant interviews	N/A	1	3	Close alignment with 10YDP / NEP / NDC considered.
Outcome 2: Improved enabling environment for implementing and scaling solar based, sustainable water supply systems.	*Number of trained technical and/or policy experts*	Key informant interviews	N/A	20-30 experts from Regional Office of Water and Irrigation and Woreda of Offices of Water and Irrigation trained	50-60 experts from Regional Office of Water and Irrigation and Woreda of Offices of Water and Irrigation trained	Numbers indicatively.
Outputs						

1.1 Solar water pumps installed	• Number of solar water pumps installed and functional • Reduction in diesel pump usage,	Field observation Periodic reports	*No functional SWPs in project sites* *100 diesel operated pumps*	• *50 functional SWPs* • *50 percent reduction in use of diesel pump*	*100 functional SWPs* *100 percent reduction in use of diesel pump*	*This is a minimum/conservative estimate.*
1.2 Efficient water distribution system constructed for households, irrigation and livestock use	• Kilometres of irrigation system, • Number of water points, • Number of cattle troughs,	Field measurements, Construction records, Periodic reports	0	20 km of mains, 33 km of sub-mains, 25 water points, 20 cattle troughs	20.8 km, 66.7 km of sub-mains, 52 water points, 42 cattle troughs	Active participation of project beneficiaries No fund disbursement delays No major price changes
1.3: Gender sensitive IUAs/Water Use Associations established and capacitated	• # of IUAs/Water Use Associations established • # of male and female farmers trained • Increase in women participation in water management,	Registration records, Training attendance records, IUA meeting records, Survey data	0	40 IUAs/WUAs established, 50 male and female farmers trained 50 percent of IUAs/WUAs management team are women	86 IUAs/WUAs established, 100 male and female farmers trained 50 percent of IUAs/WUAs management team are women	No fund disbursement delays, Gender considerations during selection of trainees Active participations of project stakeholders
1.4: Small scale revolving fund facility established	• Number of revolving fund schemes, • Number of beneficiaries	Fund establishment records, Fund disbursement records, Financial records,	0	5 revolving fund schemes 2,200 beneficiaries	10 revolving fund schemes 4,700 beneficiaries	There is continuous support from the relevant government and other stakeholders

	accessing the fund,	Beneficiary business surveys				Active community engagement
2.1: Relevant regulations, policies and guidelines created or strengthened	• Number of policies/frameworks established,	Policy documents, Expert reviews, Regulatory audits, Survey data	0	3 policies/ frameworks established	6 policies/ frameworks established	Policy & regulatory improvements in number and quality as appropriate
2.2: Digital MRV, and payment system established.	• Number and overall share of wells equipped with digital payment and metering systems	Field observation visits	0	50 of all rehabilitated wells	100 of all rehabilitated wells	Interlinkage with NDC reporting considered.
2.3: Gender sensitive business models and financial instruments identified	• # of Business models co-created • Share of women-led agro-businesses associated with SWP technology	Key informant interviews	0	5 business models, Women constitute at least 50 percent of the agro-businesses	10 business models, Women constitute at least 50 percent of the agro-businesses	There is active stakeholders participation Continuous training and supervision
2.4: Local technicians trained on O&M of SWP and irrigation systems	• # of trained technicians;	Training reports	0	50 local technicians	100 technicians	Availability of trainees, Provision of quality training and materials.
2.5: Knowledge sharing and coordination platform established	*Existence (yes/no) and quality of the knowledge-sharing and coordination platform*	Observation	0	1 knowledge sharing and coordination platform created	1 platform qualitatively improved and disseminated	Active participation from stakeholders Effective dissemination and use of the platform
Project/programme co-benefit indicators						

Co-benefit 1: Improved local employment opportunities and local economy	• Number of local employment opportunities created. • Increase in local economic activities	Employment records. Economic activity reports. Surveys/interviews with local businesses	Limited local employment opportunities Low level of local economic activities	5,000 local employment opportunities created. 10% increase in local economic activities.	11,500 local employment opportunities created. 30% increase in local economic activities	Local community engagement and participation. Support from local government and stakeholders
Co-benefit 2: Enhanced awareness and capacity to design and operate sustainable water supply systems using renewable energy	• Number of individuals trained. • Number of sustainable water supply systems designed and operated	Training attendance records. System design and operational reports	Limited awareness and capacity in sustainable water supply systems	100 individuals trained. 50 sustainable water supply systems designed and operated	200 individuals trained. 100 sustainable water supply systems designed and operated	Availability of training resources and materials. Continuous support and follow-up
Co-benefit 3: Increased leadership of women and girl education	• Number of women in leadership positions. • Number of girls enrolled in education programs	Leadership records. Enrollment records of educational institutions	Limited female leadership. Low enrollment of girls in education	50 women in leadership positions. 10% increase in girl enrollment	100 women in leadership positions. 20% increase in girl enrollment.	Gender-sensitive policies and practices. Active participation from women's groups
Co-benefit 4: Enhanced food-security	• Number of households with improved food security. • Increase in agricultural productivity	Household surveys. Agricultural productivity reports	Low food security among households. Limited agricultural productivity	10,270 households with improved food security. 20% increase in agricultural productivity	30,972 households with improved food security. 50% increase in agricultural productivity	Effective implementation of agricultural practices. Favorable weather conditions
Co-benefit 5: Improved health through access to safe and sustainable drinking water	• Number of households with access to safe drinking water. • Reduction in water-borne diseases	Water quality reports. Health surveys and medical records	Limited access to safe drinking water. High incidence of water-borne diseases.	25,330 households with access to safe drinking water. 10% reduction in water-borne diseases	66,540 households with access to safe drinking water. 30% reduction in water-borne diseases	Effective implementation of water supply systems. Regular monitoring and maintenance of water quality

E.6. Project/programme activities and deliverables

Activities	Description	Sub-activities	Deliverables
Component 1: Community Resilience			
1.1.1: Rehabilitation of wells and testing of water quality.	Build and operate solar water pumping infrastructure	1.1.1.1: Conduct a comprehensive assessment of existing wells and water sources. 1.1.1.2: Perform necessary repairs and cleaning of wells. 1.1.1.3: Install or replace well casings, pumps, or other components 1.1.1.4: Collect and analyze water samples for quality testing.	A minimum of 100 of solar powered water pumps and related systems installed
1.1.2: Procurement and Installation of solar PV systems, submersible pumps, and irrigation systems	Install submersible pumps and irrigation systems powered by solar PV	1.1.2.1: Assess site conditions and prepare optimal system design and components. 1.1.2.2: Conduct a competitive bidding process and select qualified suppliers. 1.1.2.3: Transport and deliver solar PV systems, submersible pumps, and irrigation equipment to the site. 1.1.2.4: Install and configure the solar PV systems, including panels, inverters, pumps, riser pipes and electrical components.	Complete 100 solar PV systems with submersible pumps and irrigation systems
1.1.3: Operations and maintenance of SWP and water supply infrastructure	Maintain and operate solar water pumping systems	1.3.1: Develop and implement a comprehensive operations and maintenance plan. 1.1.3.2: Conduct regular inspections and monitoring of the SWP and water supply infrastructure. 1.1.3.3: Provide training and capacity building for local personnel on operations and maintenance procedures.	100 fully operational and well-maintained SWP and water supply systems

		1.1.3.4: Establish a system for recording and addressing any issues or repairs needed	
1.2.1: Construction of pipe network, irrigation infrastructure and point collection.	Improve agriculture productivity and production through provision of access to irrigation	1.2.2.1: Conduct a detailed site survey to plan the pipe network and irrigation infrastructure layout. 1.2.2.2: Procure and transport necessary materials, such as pipes, fittings, valves, control systems, and construction equipment 1.2.2.3: Excavate and prepare the trenches for laying the pipe network and irrigation pipelines. 1.2.2.4: Install and connect the pipe networks and pipelines with pumps, control systems, reservoirs for efficient water distribution. 1.2.2.5: Test and commission the installed irrigation infrastructure and pipe networks for proper operation.	3,340 ha of land access to sustainable irrigation for crops (Kobo-Girana) and fodder (Borena) ~4,500 small holder farmers with improved agriculture productivity and production through access to irrigation
1.2.2 Install smart water meters to monitor usage.	Enhance access to safe potable water	1.2.2.1: Procure and transport the required smart water meters and associated equipment. 1.2.2.2: Install the smart water meters at the identified locations, ensuring proper connectivity and data transmission. 1.2.2.3: Configure and integrate the water meters with a centralized monitoring and data management system. 1.2.2.4: Provide training to relevant personnel on the operation and maintenance of the smart water meters.	~66,000 rural households with improved water access (direct beneficiaries)

1.2.3: Design and refine payment tariff for community water supply payments.	Set community water supply tariffs	1.2.3.1: Conduct a community-wide assessment of affordable but cost reflective rates for water supply services. 1.2.3.2: Analyze the costs associated with operating and maintaining the water supply infrastructure. 1.2.3.3: Develop a fair and sustainable pricing structure for water usage. 1.2.3.4: Consult with community representatives and stakeholders to refine the proposed tariff. 1.2.3.5: Implement and communicate the finalized payment tariff to the community.	Fair and sustainable water supply tariffs
1.2.4 Operation and Maintenance manual of Water Supply Infrastructure	Develop O&M manual for water supply infrastructure	1.2.5.1: Develop and implement a comprehensive operations and maintenance plan for the water supply infrastructure. 1.2.5.2: Conduct regular inspections and monitoring of the SWP and water supply infrastructure 1.2.5.3: Provide training and capacity building for local personnel on operations and maintenance procedures. 1.2.5.4: Establish a system for recording and addressing any issues or repairs needed in a timely manner.	1comprehensive O&M manual
1.3.1 Facilitate the formation of IUAs/WUAs with a focus on gender inclusivity.	Form IUAs/WUAs with gender inclusivity focus	1.3.1.1: Conduct community mobilization and awareness campaigns to promote the importance of gender inclusivity in water management. 1.3.1.2: Identify and engage with local women's groups, community leaders, and other stakeholders to ensure broad representation.	86 inclusive IUAs/WUAs with gender balance

		1.3.1.3: Facilitate the election or nomination process for IUA/WUA members, ensuring equal opportunities for women's participation. 1.3.1.4: Establish clear roles and responsibilities within the IUAs/WUAs, promoting gender balance in leadership positions. 1.3.1.5: Provide training and capacity building on gender mainstreaming and inclusive decision-making processes.	
1.3.2 Draft and approve by-laws mandating minimum participation levels for women.	Draft and approve by-laws for women's participation	1.3.2.1: Review existing by-laws or governing documents of the IUAs/WUAs to identify opportunities for incorporating gender considerations. 1.3.2.2: Consult with IUA/WUA members, community representatives, and gender experts to determine appropriate minimum participation levels for women. 1.3.2.3: Draft by-law amendments or new by-laws that clearly outline the minimum participation requirements for women. 1.3.2.4: Facilitate participatory discussions and consensus-building processes to approve the updated by-laws. 1.3.2.5: Disseminate and implement the approved by-laws, ensuring compliance and monitoring of women's participation levels.	Approved by-laws with minimum women's participation levels
1.3.3 Develop and implement training programs for IUA/WUA members.	Implement training for IUA/WUA members	1.3.3.1: Conduct a needs assessment to identify the specific training requirements for IUA/WUA members, considering gender-specific needs.	100 trained IUA/WUA members

		1.3.3.2: Design and develop comprehensive training modules covering topics such as water management, conflict resolution, financial management, and leadership skills. 1.3.3.3: Ensure that training materials is translated into local languages and delivery methods are gender-sensitive and inclusive. 1.3.3.4: Facilitate the delivery of training programs ensuring equal participation and engagement of both men and women. 1.3.3.5: Conduct post-training evaluations and provide ongoing support and refresher training as needed.	
1.3.4 Provide ongoing operational support and technical assistance to IUAs/WUAs.	Support and assist IUAs/WUAs	1.3.4.1: Establish a dedicated support team or focal point to assist IUAs/WUAs with operational challenges and technical queries. 1.3.4.2: Conduct regular monitoring and evaluation visits to assess the performance and needs of IUAs/WUAs. 1.3.4.3: Facilitate knowledge-sharing and peer-learning opportunities among IUAs/WUAs, promoting the exchange of best practices. 1.3.4.4: Provide specialized technical assistance and guidance on issues such as water resource management, infrastructure maintenance, and conflict resolution. 1.3.4.5: Encourage and support the participation of women in decision-making	86 Operational and technically assisted IUAs/WUAs

		processes and leadership roles within IUAs/WUAs.	
1.4.1 Establish and/or strengthen RUSACCOs.	Establish and strengthen RUSACCOs	1.4.1: Establish and/or strengthen RUSACCOs. 1.4.1.1: Conduct a baseline assessment to identify existing RUSACCOs and their capacity needs. 1.4.1.2: Facilitate the formation of new RUSACCOs in areas where they do not exist, ensuring inclusive membership and governance structures. 1.4.1.3: Assist RUSACCOs in developing or updating their bylaws, policies, and operational procedures. 1.4.1.4: Facilitate linkages between RUSACCOs and financial institutions.	Functional RUSACCOs
1.4.2 Provide training to RUSACCO members on financial literacy.	Train RUSACCO members on financial literacy	1.4.2.1: Develop a comprehensive financial literacy training curriculum tailored to the needs of RUSACCO members. 1.4.2.2: Provide capacity-building support to existing and new RUSACCOs on organizational management, financial management, and governance. 1.4.2.3: Conduct participatory training sessions covering topics such as budgeting, saving, borrowing, and investing. 1.4.2.4: Incorporate practical exercises and case studies to enhance learning and application of financial concepts. 1.4.2.5: Provide post-training follow-up and support to reinforce the knowledge and skills acquired	4,700 financially literate RUSACCO members

1.4.3 Define revolving fund terms, including repayment schedules.	Define terms for revolving fund	1.4.3.1: Consult with RUSACCO representatives, community members, and relevant stakeholders to understand their needs and preferences. 1.4.3.2: Develop clear and transparent criteria for accessing the revolving fund, including eligibility requirements. 1.4.3.3: Determine appropriate revolving fund repayment schedules, considering local economic conditions and beneficiaries capacities. 1.4.3.4: Establish mechanisms for monitoring and enforcing repayment, including provisions for late payments or defaults. 1.4.3.5: Communicate the revolving fund terms and conditions to RUSACCOs and potential beneficiaries.	Clear revolving fund terms
1.4.4 Establish revolving fund.	Allocate GCF grant for revolving fund	1.4.4.1: Conduct a financial analysis to determine the appropriate amount to be allocated from the GCF grant for the revolving fund. 1.4.4.2: Develop a sustainable financial plan for the revolving fund, considering initial capitalization, operating costs, and potential revenue streams. 1.4.4.3: Establish a separate accounting system and bank account for the revolving fund to ensure proper fund management. 1.4.4.4: Implement robust financial controls and auditing mechanisms to ensure transparency and accountability.	Dedicated GCF grant amount for revolving fund

		1.4.4.5: Develop a strategy for replenishing and growing the revolving fund over time.	
1.4.5. Develop a revolving fund management and administration guideline/ manual.	Develop guidelines for revolving fund management	1.4.5.1: Conduct a comprehensive review of best practices and existing guidelines for revolving fund management. 1.4.5.2: Consult with RUSACCOs, financial experts, and relevant stakeholders to gather input and feedback. 1.4.5.3: Develop a clear and detailed guideline/manual covering aspects such as fund governance, lending procedures, risk management, and reporting. 1.4.5.4: Ensure that the guideline/manual incorporates principles of transparency, accountability, and inclusivity. 1.4.5.5: Conduct training and dissemination activities to familiarize RUSACCOs and relevant personnel with the guideline/manual.	1 revolving fund management guidelines/manual
Component 2: Enabling Environment			
2.1.1: Develop and implement/ strengthen robust national and regional licensing and regulatory frameworks for groundwater abstraction and use.	Integrating GCF supported activities in sectoral resilience plans and NDC accounting and reporting	2.1.1.1: Conduct a comprehensive review of existing policies, regulations, and institutional frameworks related to groundwater management. 2.1.1.2: Engage stakeholders, including relevant government agencies, water user associations, and experts, to gather input and recommendations. 2.1.1.3: Draft or update licensing and regulatory frameworks for groundwater abstraction and use, considering sustainable management principles.	Policy & regulatory improvements in number and quality as appropriate

		2.1.1.4: Establish clear procedures and criteria for issuing licenses, monitoring compliance, and enforcing regulations. 2.1.1.5: Conduct awareness campaigns and capacity-building activities to ensure effective implementation of the new/updated frameworks.	
2.1.2: Implement the use of digital water meters to measure groundwater extraction at each borehole.	Use digital water meters for groundwater monitoring	2.1.2.1: Develop a centralized data management system for collecting and analysing water extraction data (physical and chemical) from the digital meters. 2.1.2.2: Establish protocols for data sharing and reporting to relevant authorities for monitoring and regulatory purposes.	100 digital water meters in place
2.1.3: Update and strengthen technical quality benchmarks or standards for SWP technologies, including energy efficiency standards for submersible pumps and solar PV systems.	Update technical standards for SWP technologies	2.1.3.1: Review existing technical standards and benchmarks for SWP technologies, including energy efficiency standards. 2.1.3.2: Engage relevant stakeholders, including industry experts, manufacturers, and research institutions, to gather input and recommendations. 2.1.3.3: Update or develop new technical quality benchmarks and standards, considering advancements in technology and best practices. 2.1.3.4: Establish mechanisms for monitoring and enforcing compliance with the updated standards and benchmarks. 2.1.3.5: Conduct awareness campaigns and capacity-building activities to ensure widespread adoption of the new standards and benchmarks.	Updated technical benchmarks for SWP technologies

2.2.1: Design and Development of Digital MRV Platform.	Develop digital technology & platforms for MRV purpose	2.2.1.1: Conduct a comprehensive requirements gathering process, involving relevant stakeholders and experts. 2.2.1.2: Define the system architecture, data models, and integration points with existing systems. 2.2.1.3: Develop the digital MRV platform, incorporating features for data collection, analysis, reporting, and verification. 2.2.1.4: Implement robust security measures, including user authentication, data encryption, and access controls. 2.2.1.5: Conduct rigorous testing and piloting of the platform to ensure functionality and usability.	Deployment of 1 digital MRV system
2.2.2: Support the integration of digital MRV system with the national MRV framework.	Integrate digital MRV with national framework	2.2.2.1: Analyze the existing national MRV framework and identify integration points for the digital MRV system. 2.2.2.2: Collaborate with relevant government agencies and stakeholders to ensure alignment with national standards and protocols. 2.2.2.3: Develop data exchange protocols and interfaces for seamless integration between the systems. 2.2.2.4: Conduct end-to-end testing and validation of the integrated systems. 2.2.2.5: Establish governance mechanisms and data-sharing agreements to ensure data security and privacy.	Integrated digital MRV system with national framework
2.2.3: Develop a training material for the digital MRV system and conduct	Train on digital MRV system	2.2.3.1: Develop comprehensive training materials, including user manuals, tutorials, and multimedia resources.	100 personnel trained on digital MRV system

training sessions for government officials, IUAs, and local communities		2.2.3.2: Ensure that the training materials are tailored to the needs and literacy levels of different target audiences. 2.2.3.3: Identify and train local facilitators or resource persons to deliver the training sessions. 2.2.3.4: Conduct hands-on training sessions, covering system navigation, data entry, reporting, and troubleshooting. 2.2.3.5: Establish a support system, such as a helpdesk or online forums, to address queries and provide ongoing assistance.	
2.3.1: Identify gender-specific needs and barriers in current business models and financial instruments.	Identify gender needs in business models	2.3.1.1: Conduct a comprehensive gender analysis to understand the roles, responsibilities, and challenges faced by women in agriculture and water management. 2.3.1.2: Engage with local women's groups, community leaders, and gender experts to gather insights and feedback. 2.3.1.3: Evaluate existing business models and financial instruments to identify potential gender biases or exclusionary practices. 2.3.1.4: Analyze data and statistics related to women's access to resources, decision-making, and economic opportunities. 2.3.1.5: Document the findings and recommendations for addressing gender-specific needs and barriers.	Identified gender-specific needs and barriers

2.3.2: Develop business models that consider local gender roles in agriculture and water use.	Develop gender-sensitive business models	2.3.2.1: Review the findings from the gender analysis and stakeholder consultations. 2.3.2.2: Collaborate with gender experts, community representatives, and business development specialists to design inclusive business models. 2.3.2.3: Incorporate strategies to address gender-specific needs, such as flexible working arrangements, access to childcare, and equal decision-making opportunities. 2.3.2.4: Explore innovative approaches, such as women-led cooperatives, collective bargaining, and gender-responsive value chains. 2.3.2.5: Pilot and refine the business models through iterative testing and feedback from local communities.	10 inclusive business models
2.3.3: Conduct training programs on gender-sensitive business models and financial instruments.	Train on gender-sensitive business models	2.3.3.1: Develop comprehensive training curricula and materials on gender-sensitive business practices and financial literacy. 2.3.3.2: Engage local facilitators and resource persons with expertise in gender mainstreaming and economic empowerment. 2.3.3.3: Conduct interactive training sessions, incorporating case studies, role-playing, and practical exercises. 2.3.3.4: Tailor the training content and delivery methods to ensure accessibility and cultural relevance.	100 persons trained on gender-sensitive business models

		2.3.3.5: Provide post-training support and follow-up to reinforce the knowledge and skills acquired.	
2.3.4: Conduct workshops and training sessions for IUAs, RUSACCOs, and local communities.	Conduct workshops on gender-sensitive business practices	2.3.4.1: Organize workshops and training sessions targeting IUAs, RUSACCOs, and local community members. 2.3.4.2: Facilitate discussions on the importance of gender inclusivity in business models and financial instruments. 2.3.4.3: Share best practices and success stories from other regions or initiatives. 2.3.4.4: Encourage active participation and feedback from attendees to identify contextual challenges and opportunities. 2.3.4.5: Develop action plans and follow-up mechanisms to support the implementation of gender-sensitive approaches.	3 workshops conducted
2.4.1: Conduct a needs assessment to identify the specific skills required for O&M of SWP and irrigation systems.	Assess skills needed for O&M of SWP and irrigation	2.4.1.1: Engage with local communities, water user associations, and relevant stakeholders to understand their current challenges and knowledge gaps. 2.4.1.2: Assess the existing technical capabilities and experience of local technicians in O&M of SWP and irrigation systems. 2.4.1.3: Identify the specific skills and competencies required for various O&M tasks, such as installation, troubleshooting, maintenance, and repair. 2.4.1.4: Analyze the training needs across different regions and localities to ensure comprehensive coverage.	Documented O&M skills needed

		2.4.1.5: Document the findings and prioritize the critical skills required for effective O&M.	
2.4.2: Organize training workshops in collaboration with the academia and regional bureaus.	Strengthen vocational training program on SWP and irrigation	2.4.2.1: Establish partnerships and collaborations with the Faculty of Technology at the Addis Abeba University, Ethiopian Water Technology Institute (EWTI) and relevant regional bureaus nationally for organizing the training workshops. 2.4.2.2: Develop comprehensive training curricula and materials based on the identified skill requirements and best practices. 2.4.2.3: Engage experienced trainers and subject matter experts from EWTI, regional bureaus, and other relevant organizations. 2.4.2.4: Organize practical, hands-on training workshops covering topics such as system installation, maintenance, troubleshooting, and repair. 2.4.2.5: Incorporate field visits and on-site demonstrations to provide real-world experience for the local technicians.	100 trained local technicians
2.5.1: Identify key stakeholders and conduct a comprehensive needs assessment to identify gaps in knowledge sharing and coordination.	Comprehensive policy coordination among all GOE agencies	2.5.1.1: Map out the key stakeholders involved in solar water pumping and irrigation systems, including government agencies, research institutions, NGOs, and community organizations. 2.5.1.2: Engage with these stakeholders through surveys, interviews, and focus group discussions to understand their	Improved knowledge and policy coordination

		knowledge-sharing and coordination needs. 2.5.1.3: Analyze existing mechanisms and platforms for knowledge sharing and coordination, and identify gaps and challenges. 2.5.1.4: Assess the technical infrastructure and digital literacy levels of stakeholders to ensure an inclusive and accessible platform. 2.5.1.5: Document the findings and prioritize the critical knowledge-sharing and coordination needs.	
2.5.2: Development of Knowledge Management and Dissemination Strategy.	Develop knowledge management strategy	2.5.2.1: Establish a cross-functional team with representatives from the key stakeholder groups to oversee the strategy development. 2.5.2.2: Define the objectives, scope, and target audience for the knowledge management and dissemination strategy. 2.5.2.3: Identify the types of knowledge and information to be shared, such as best practices, research findings, technical guidelines, and case studies. 2.5.2.4: Determine the appropriate channels and formats for knowledge dissemination, such as online platforms, publications, workshops, and training events. 2.5.2.5: Develop a plan for monitoring, evaluating, and updating the strategy to ensure its effectiveness and relevance.	1 Knowledge management strategy

2.5.3: Design and develop the online knowledge-sharing and coordination platform.	Develop online platform for knowledge sharing	2.5.3.1: Based on the needs assessment and strategy, define the functional requirements and specifications for the online platform. 2.5.3.2: Identify and engage with experienced web developers and user experience designers to create a user-friendly and accessible platform. 2.5.3.3: Incorporate features such as document repositories, discussion forums, news and event calendars, and collaboration tools. 2.5.3.4: Ensure the platform adheres to best practices in terms of security, data protection, and accessibility standards. 2.5.3.5: Conduct user testing and gather feedback from stakeholders to refine and improve the platform before its official launch.	1 Online knowledge-sharing platform

E.7. Monitoring, reporting and evaluation arrangements (max. 500 words, approximately 1 page)

269. M&E is one of several implementation and management tools that support successful delivery of this project. Without careful monitoring, the necessary data are not collected; hence learning cannot be achieved, and evaluation cannot be done well. M&E are one of the core responsibilities MOF which will carry out the M&E plan guided by the CRGE Facility Monitoring and Evaluation Manual. At the current moment, around 4.9% of the total project budget is reserved for effective and target-oriented M&E, including alignment with NDC MRV systems, cross-cutting quality assurance and technical assistance.

270. The monitoring and reporting system of the proposed project will be gender-sensitive and will follow guidance from the GCF and comply with GCF M&E policy, ensuring that the project maintains a simple and interactive monitoring system allowing for regular reporting and learning at all levels. It is expected that it will be based on the following core activities:

271. **Activity Recording/Process Documentation**: Progress monitoring will provide evidence on accomplishment of the core activities planned under each Output and Activity, which will be scrutinized by assigning milestones and implementation timelines. This will help the strategic and operational managers to identify which activities are ahead, behind or on schedule. The Accredited Entity and executing entities will ensure routine monitoring on the use of inputs (including finances) and implementation of activities.

272. **Knowledge Management and Dissemination:** Annual institutional learning events will be conducted to reflect on observed changes and stock of progress made. These events will facilitate sharing of experiences and lessons learned among participating entities, including regional stakeholders.

273. **Annual Performance Assessment:** The Executing entities will submit an annual Performance Assessment Report (PAR) on the project Outputs. The PARs inform two monitoring activities at the project coordination level – annual monitoring missions and annual reviews/reports – and will leverage the lessons and insights from responses to the M&E. The reporting process is similar to that for quarterly reports. Executing entities will aggregate component reports before submission to their respective Project Coordination Units, which will then submit to the CRGE Facility. PARs capture Activity, Output and Outcome-level information. The report combines national and GCF reporting requirements, which include but are not limited to, reporting on:
    - Progress made towards project Objective and project Outcomes – each with indicators, baseline data and end-of-project targets (cumulative)
    - Project Outputs delivered per project Outcome (annual)
    - Financial reports
    - Lesson learned/good practice; and
    - Annual Work Plan (for the following year)

274. Based on the annual performance assessment and review, the CRGE Facility consolidates and submits annual report to the GCF in accordance with the GCF standard reporting formats. The Facility also shares similar report to the NDA.

275. Data reported as a result of this project will be integrated into national reporting processes in the context of tracking progress towards the 2030 targets for the 10YDP and updated NDC by MoPD as the NDA, which also co-leads the CRGE Facility jointly with MOF.

276. **Joint Monitoring Missions**: Joint monitoring missions will provide an opportunity to engage stakeholders of the project, including those that do not have a direct role in implementation. These missions will be organized by the CRGE Facility or line ministries, to be undertaken annually, and involve the Executing entities and other development partners as deemed relevant. It is important to note that the latter will not have any discretion role in the implementation of the project other than provision of support and assistance if they can and ensuring complementarity and alignment.

277. **Ad-hoc Quality Assurance Missions:** These will be co-organized by the relevant ministry and the CRGE Facility for the purpose of validating M&E information during site visits. A key part of these missions is to hold reflection meetings at regional and Woreda levels. Observations, decisions, and action points arising from the mission will be distributed to participants.

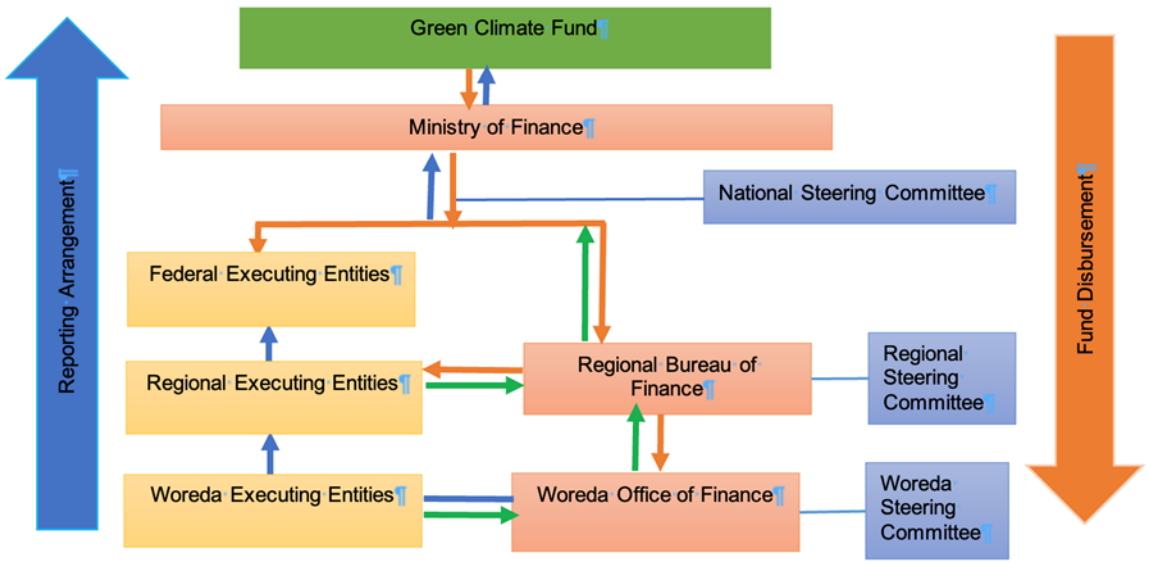
278. The CRGE Facility will conduct periodic financial spot-checks and facilitate regular trainings, workshops, review meetings for the project finance officers and project technical staff. The Facility ensures preparation and dissemination of customized and fit for purpose financial and procurement management guidelines to the woreda Finance Officers. It will also ensure that financial management and procurement

activities are conducted in accordance with existing government procurement and financial management policies and procedures.

Reporting Arrangement

279. The executing entities at federal, regional and woreda levels are responsible for submitting periodic reports. The Federal EEs shall submit quarterly reports to the CRGE Facility. These reports will provide detailed information on project implementation, including financial status, progress on activities, and compliance with standards. The Regional EEs (Bureau of Water and Energy and Bureau of Irrigation and Lowlands) shall submit quarterly report to the Federal EEs for activities, which they directly manage and implement. The Regional Bureau of Finance receives financial reports from Woreda Office of Finance of the project target woredas on a quarterly basis for woreda level activities. BOFED will consolidate the regional and woreda financial reports and send to the CRGE Facility. BOFED shall also share copy of the consolidated financial report to the regional EEs and provide status updates during the regional Steering Committee meetings. The CRGE Facility will consolidate reports from EEs and submit annual reports to the GCF, following the standard GCF reporting formats. The Facility will also share similar reports with the NDA. The Facility will facilitate an annual external audit of the project and submit the audit report to the GCF. BOFDs ensure and support timely submission of activity based financial reports by WOFEDs. The fund disbursement and reporting arrangement of the project is presented in the following diagram.

Figure 11: Fund disbursement and Reporting Arrangement



Project Mid-term and Final Evaluation

280. The mid-term evaluation of the project "Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia" aims to assess the progress made towards achieving the project's objectives at the halfway mark of its implementation period. The evaluation will focus on the effectiveness, efficiency, and relevance of the project activities. Key areas of assessment will include the installation and operationalization of solar water pumps, the construction of water distribution systems, and the establishment of community-managed irrigation schemes. The evaluation will involve consultations with stakeholders, including community members, local authorities, and executing entities, to gather insights and feedback on project implementation. The findings will highlight successes, identify challenges, and provide recommendations for adjustments to ensure the project remains on track to achieve its intended outcomes. The final evaluation will provide a comprehensive assessment of the project's overall performance upon completion. It will evaluate the project's impact on climate resilience, water access, and agricultural productivity in the

	target regions. The evaluation will measure the achievement of project objectives, the sustainability of outcomes, and the effectiveness of the implemented strategies and technologies. Key aspects of the evaluation will include the long-term operational success of solar water pumping systems, the governance and management capacities of community irrigation associations, and the environmental and socio-economic benefits realized. The evaluation will also assess the project's alignment with national climate adaptation goals and its contributions to gender equality and community empowerment. The findings will inform future projects and provide valuable lessons for scaling up similar interventions across other regions.

RISK ASSESSMENT AND MANAGEMENT

F.1. Risk factors and mitigations measures (max. 3 pages)

Selected Risk Factor 1

Category	Probability	Impact
Forex	Low	Medium

Description

281. The project requires foreign currency for technology imports, which will be given through GCF grant financing denominated in USD. Revenues from membership and commercial user fees in local currency will be spent on local service provision, e.g., through external service providers for asset maintenance. GCF grant financing as well as MOF co-financing will be utilized for CAPEX and partially OPEX expenditure on technology import and salaries. The risk of further inflationary tendencies of Ethiopian Birr and the ensuing reduced ability to repay loans is one major reason why this application is grant-centered.

Mitigation Measure(s)

282. A potential mitigation measure could be to increase productivity for agricultural products targeting exports and value addition in Ethiopia's green industrial parks. This strategy is directly aligned with Agricultural Development Led Industrialization (ADLI) of Ethiopia. However, the first priority is to achieve community resilience, public health and food security. Therefore, financial risks cannot be fully mitigated.

Selected Risk Factor 2

Category	Probability	Impact
Technical and operational	Medium	Medium

Description

283. The executing entities have limited knowledge in the operation and maintenance of solar powered submersible pumps. Furthermore, applicability of solar technologies for irrigation purposes is a novel technology, thus getting the required buy in from the community to participate in commercial farming might be a challenge until the first agricultural produce yields.

Mitigation Measure(s)

284. This project has incorporated systems that are mostly automated and require minimal human interference. Furthermore, competent project developers who have experience installing and running these systems will be contracted to work with the service providers to transfer knowledge in operating and managing the assets. All incorporated activities that will engage the community in implementing this project and build capacity within the community and at the zonal level for operation and maintenance schedules. Moreover, capacity development and training are integrated into strengthening the enabling environment for the project. A knowledge transfer plan from the TA providers to the service providers and IUA's has been outlined in the feasibility study document.

Selected Risk Factor 3

Category	Probability	Impact
Technical and operational	Medium	Medium

Description

285. The boreholes identified for this project were drilled and capped in 2013/14. Although boreholes have a regular service period of over 20 years, there is a risk that some boreholes and the ground water quality might not fulfil the physical and chemical characteristics that has been reported in the well completion report.

Mitigation Measure(s)

286. To mitigate this risk, at the commencement of the project, all wells will be rehabilitated and pump tested for a minimum and maximum of 24 and 72 hours respectively, with the required water chemical analysis conducted at a laboratory to determine water safety in line with WHO standards. To ensure compliance with WHO standards, mandatory testing for major cations, anions, pH levels, and total dissolved solids (TDS) will be carried out, thus preventing the possible emergence of salinity-related concerns. Additionally, digital water

meters will be affixed to each borehole, serving to monitor shifts in groundwater composition over an extended timeframe and enabling the timely implementation of solutions. Minimum specifications on the type of machinery to be deployed to rehabilitate the wells has also been provided in the feasibility study document.

Selected Risk Factor 4		
Category	**Probability**	**Impact**
Technical and operational	Medium	Medium
Description		
287. Global supply chain disruptions could continue and affect the time schedule to commence hamper procurement. All CAPEX costs in this project are directly attributed towards purchasing and importing equipment's from overseas and thus the risk of products arriving late into the country can delay the work plan.		
Mitigation		
288. The workplan has considered this scenario and has extended the procurement period for a full year and also have extended the installation of the systems to three years. Thus a total of four years has been scheduled for the procurement, equipment installation and commissioning of the systems.		
Selected Risk Factor 5		
Category	**Probability**	**Impact**
Governance	Low	Medium
Description		
289. Regional conflict in the Northern parts of Amhara (bordering with Tigray) that could affect project implementation. Localized incidents are happening across regions in Ethiopia, often resulting in violent attacks and killings by groups against another. This has occurred in Western Oromia and observed in other parts of the region. Since August/ September 2023, there have been ongoing conflicts in Amhara region between an armed group and the central government related with issues of disarmament. The conflict has been fueled by elite-backed political narratives generated from all sides.		
Mitigation		
290. The conflict in Amhara region has never been a full-scale regional conflict and there is peace and stability in most part of the region including in the current project target districts. It is important to note that most development partners and reports from UN-OCHA don't categorize the entire Amhara region as a conflict hotspot. The implementation of many public and development partners financed projects and programs (including an ongoing GCF project and multiple World Bank projects), is currently going on in Ahmara region. The project design has put this scenario into consideration and targets to start from the southern parts of the valley for project implementation i.e. in the Amhara region. 291. The cause of the incidents is essentially political and requires political settlement. Hence its scope is beyond the control of the current project. Currently, the government is employing amicable solutions to the violent conflicts to settle the tension between the government and the armed group in Oromia and in the Amhara region. 292. Whilst there was ongoing conflict in the Tigray province which is adjacent to the valley of Kobo-Girana, the conflict has now subsided and industries including the Industrial Parks located within the region have now re-started to operate. 293. In the unfortunate likelihood that the conflict starts again in the adjacent Tigray region, project implementation target area may be pushed further South where there are additional boreholes that have been capped that are not included in the borehole selection thus far. The GCF support for such activities is furthermore crucial to contribute to providing access to existential goods such as food and water, which, at the same time, may have indirect preventative effects of future conflicts. In close collaboration with the relevant stakeholders, including the NDA, the AE will closely assess the conflict on the specific project target sites and ensure execution of mitigation actions including halting disbursement of GCF proceeds under such circumstances.		

Selected Risk Factor 6		
Category	**Probability**	**Impact: High**
Technical and operational	Low	Select

Description	
294.	Lack of knowledge of the value and use of the project assets could potentially lead to intentional damage through vandalism of the equipment. Furthermore, the lack of proper knowledge about operation and maintenance of assets is another factor that could lead to unintentional deterioration of the lifetime of assets.
Mitigation	
295.	The project proponents have recommended specialized service providers be selected from within the localities in order to build trust and ownership of the assets. Several measures will be adopted to ensure the security of the water pumps from threats such as vandalism or theft. Community engagement will be crucial to foster a sense of ownership and responsibility within the local community, who are the main beneficiaries, to protect the water pumps. This will be accompanied by an awareness campaign at the start of the project to educate the community about the importance of water pumps, how they improve livelihoods, and emphasize the negative consequences of theft or vandalism. Community Agreements will also be drawn up as part of the IUA establishment, with clear rules and regulations on the use and protection of the water pumps. Violation of these agreements will result in community-imposed penalties or restrictions. Furthermore, as indicated in Annex 2, the water pumps installations will be secured using enclosures or fencing and high quality locking mechanisms to deter theft and vandalism. It has also been scheduled and further recommended that the service providers are established by the time the equipment is procured and the project developers can be mobilized to install the assets. The service providers will be contractually obligated to provide security for the assets. The service providers will also be working with the project partners to extend technical support that requires minimal technical experience (threading and connecting pipes and fittings/connecting cables/excavation works/measuring discharge), working with the regional counterparts in mobilizing the community, support in establishing the IUA's amongst others. The system designed in this proposal requires minimal operational interference from humans and is mostly automated. However, regular operational and maintenance plan will be developed, and the service providers are trained against meeting that deliverable. Furthermore, the equipment manufacturer will be required to cover the equipment's under a warranty period. Recommended spare parts has also been included in the procurement plan to ensure that the assets do not cease operation right after the system has been commissioned. The IUA's and all small holders enveloped under that association will also be working with the project developers in terms of preparing their land, irrigation canals and construction works which will be important to embed ownership of this project and the results thereof.

Selected Risk Factor 7		
Category	**Probability**	**Impact: High**
Technical and operational	Low	Select
Description		
296.	Mal-adaptation of project outcomes as a result of excessive ground water abstraction.	
Mitigation		
297.	Based on the hydrogeological and water balance studies, groundwater balance (please refer to annexed under 4 in the feasibility study (Annex 2) that provides a detailed synthesis of the recharge potential of groundwater) the submersible pump and solar PV specifications (the solar PV's with no battery as a backup to power the submersibles) and inverter size has been proposed with specific discharge rate such that the configuration cannot be surpassed for each borehole. The design will give enough time for the well recharge, Moreover, the discharge volumes configured in the design will be well below the limits of the allowable water abstraction volumes found in the water balance study, described in Annex 2. This ensures over abstraction of ground water resources is avoided and the system is locked to extract groundwater in line with the volume and the proposed discharge rate as indicated in Table 19 & 20 of the Feasibility study (Annex 2).This essentially will put the system to work for a maximum of 6.5 hours per day as opposed to boreholes that are pumped for at least 10 hours per day when powered by the grid or diesel generators. Additionally, digital water meters (Divers) will be installed to measure the amount of ground water extracted at each borehole. This information will feed back to gauging the ground water abstraction rate against the water balance study conducted for this project, which is critical information for effective water management.	

Selected Risk Factor 8		
Category	**Probability**	**Impact**
Economic (inflation)	High	Medium
Description		
298.	Inflation poses a significant risk to the project, given the recent economic trends in Ethiopia. The country's economy has been grappling with high inflation rates, often reaching double digits, which threatens to erode	

	the purchasing power of allocated funds. This erosion can lead to increased costs for goods and services necessary for the project's successful implementation. Consequently, budget overruns, delays in project timelines, and a potential reduction in the scope of project activities are real possibilities. Additionally, the impact of inflation on the cost of imported technologies and equipment could further exacerbate the financial strain, making it difficult to achieve the project objectives within the planned budget and timeline.
	Mitigation
299.	To mitigate the impacts of increase in prices of goods and services, attempt shall be made to utilize financial instruments such as forward contracts or inflation swaps to lock in prices and guard against future cost increases. Furthermore, rigorous cost monitoring system to track actual expenses against budgeted costs and regular financial reviews will be implemented. Procurement processes shall be also streamlined to ensure timely purchasing before significant inflationary increases. This can involve fast-tracking procurement approvals and reducing lead times.

GCF POLICIES AND STANDARDS

G.1. Environmental and social risk assessment (max. 750 words, approximately 1.5 pages)

300. An Environmental and Social Management Plan (ESMP) has been prepared in accordance with the GCF safeguard policies and the policies of the GoE (Annex 6). The ESMP builds on existing Environmental Impact Assessment reports that were prepared as part of the initial design work for the Kobo-Girana and Galchet-Sarite water development sites situated in the Amhara and Oromia National Regional States of Ethiopia, respectively. The full ESMP is available in Annex VII and has been uploaded onto MOF's website[88], in line with Government and GCF public disclosure policy ensuring public access to the ESMP. Based on the results of the screening conducted, the project is assessed as medium risk (Category B) in accordance with the GCF's and International Finance Corporation (IFC)/World Bank's Social and Environmental Standards Procedure. This categorization is in due recognition that the project will only operationalize an existing initiative that has already put in place most of the infrastructure that is required by the project. Furthermore, although there are some wetlands in one of the project sights, it is already a highly agrarian area and does not contain sensitive ecosystems. This categorization is in due recognition that the project will be conducted in food-insecure, and drought-affected areas and not in sensitive ecosystems (i.e., in wetlands, forests, or others). Moreover, it will have minimal adverse social impacts and nor will it impact cultural heritage. Furthermore, the anticipated impacts will be restricted to the project site and will not affect a broader area beyond the immediate project implementation sites. No displacement or resettlement of the community during the development and implementation of the project is necessary. Finally, all impacts identified will be addressed through implementation of mitigation measures and there will be minimal residual impact after the implementation of the proposed mitigation measures.
301. Impact identification has been conducted in accordance with qualitative criteria, identified based on best practices to conduct environmental impact assessments[89], in the two main phases of the project, namely design and construction phase as well as operations phase. Impacts have further been separately identified in the two project sites, i.e., Kobo-Girana (Amhara region) and Galchet-Sarite (Oromia region) water development sites. Potential impacts identified for Kobo Girana are (i) *during construction phase*: flooding and sedimentation, soil erosion, gully erosion and widening of river banks, impact on vegetation, disturbance of farmlands, impact on property and buildings, dust emission and exhaust fumes, noise, water and soil pollution, workers and public safety, and health impact such as malaria, water-borne diseases and COVID; and (ii) *during operations phase*: sustainability of the groundwater resource, contamination of groundwater sources, water quality, agrochemicals use, damage to ecological resources, hazardous solid waste, socio-economic challenges, and impact on human health.
302. Potential impacts identified for the Galchet-Sarite are (i) *during construction phase*: soil erosion and sedimentation, soil pollution, water pollution, impact on vegetation, disturbance to land, impact on property and buildings, workers and public safety issues, dust emission and exhaust fumes, noise and health impact such as malaria, water-borne diseases and COVID; and (ii) *during operations phase*: sustainability of the groundwater resource, contamination of groundwater sources, water quality, hazardous solid waste, socio-economic challenges, and impact on human health. The ESMP has developed a comprehensive list of mitigation measures for all identified potential impacts, including preliminary costing, considering costing exercises that were conducted for similar ESMPs (including for GCF approved projects in Ethiopia). This project does not involve expropriation of land from individuals. However, in case applicable, the Ethiopian government laws and GCF performance standards contain appropriate provisions with regards to compensation.
303. The ESMP further describes detailed implementation, including roles and responsibilities of different actors (Section 6 of Annex 6 of this funding proposal). Levels of roles and responsibilities of actors include all levels, i.e., from federal government to district, woreda and Kebele (village) level. Similarly, in this section the grievance and grievance redress mechanism are described in detail.
304. Potential impacts on indigenous populations has been identified as non-existent or minimal, as it will not relocate people, nor will it have negative implications on their livelihoods.

G.2. Gender assessment and action plan (max. 500 words, approximately 1 page)

[88] Ministry of Finance (MOF) (n.d.): Climate Resilient Green Economy Facility, https://www.MOFed.gov.et/programmes-projects/crge-facility/ (accessed July 15, 2022)

[89] Wood, Chris (2003): Environmental Impact Assessment: A Comparative Review, Second Edition, Pierson Education Limited, Essex

305. A full gender assessment and action plan document is available (Annex 8). The final document was developed through a desk assessment followed by inputs from gender focal persons of the CRGE Facility and Ministry of Water and Energy. It was then enriched during a project proposal validation workshop where community members and experts from different institutions took part.
306. Ethiopia's economic growth and development, as well as the livelihoods of the rural population, are highly dependent on the utilization of natural resources. Over 83% of the population are smallholder farmers, of whom 26% are female-headed households. As a result, impacts of climate change are directly felt by a significant proportion of the population. Although all rural households are vulnerable to climate change, women and female-headed households are the most vulnerable, least prepared, and likely to be worst affected by climate change. Their limited access to, and control over, resources and information, and their limited input in decision-making processes, increases their vulnerability.
307. In rural Ethiopia, securing food, water, and energy for the household, as well as maintaining overall household wellbeing, is the role of women. As a result, extreme climate events such as droughts, floods and rising temperatures place greater pressures on women. In drought-prone areas, for example, the time required for water collection increases as women and children (mostly girls) have to travel greater distances to find water. As a result, they are forced to spend more hours fetching water, which significantly increases their workload and potentially exposes them to harassment, especially in areas and times of conflict. Further, although most projects target both women and men farmers, women still benefit much less from irrigation programs due to lower access to information, including training.
308. This project aims to contribute towards baseline efforts on the ground by identifying actions that will equally benefit women, especially in the context of access to drinking water and irrigating farmland in the project areas. The key recommendations include ensuring consultations and meetings are arranged in a manner that takes the needs of women into consideration including creating women-only spaces; ensuring by-laws at grassroot level include legally binding statements on the participation of women both as members and leaders; ensuring the required trainings are provided equally to all involved; ensuring women and FHHs benefit both from better access to water, irrigation and small businesses; and conduction policy review of local water, irrigation, and/or agriculture policies to ensure gender sensitive and responsive actions continue to be addressed in the long term.
309. When implemented the project will result not only in the provision of the much-needed access to water both for drinking and irrigation purposes, but also in benefiting the community as a whole with both women and men managing the resource in equal footing and thus sharing both the responsibilities and benefits. The project is expected to empower women through access to trainings, small businesses, and decision-making positions thus giving them a chance to equally influence local development.
310. As can be seen from the detailed implementation arrangement of the project, implementation and monitoring support is given through a well-established structure at various levels - federal, region, woreda and Kebele. Community ownership is ensured through the IUAs and M&E reports generated at different levels will provide detailed information along with gender disaggregated data.

G.3. Financial management and procurement (max. 500 words, approximately 1 page)

311. The financial management and procurement of this project will be guided by the public finance management and public procurement regulations of the Government of the Federal Democratic Republic of Ethiopia. Project finance from GCF will be transferred to the MOF in accordance with the financial disbursement arrangement defined for the CRGE Facility, which is consistent with the Channel One fund flow arrangement. The CRGE Facility in MOF has already opened a dedicated account for the ongoing GCF project, , into which the GCF fund for the current project will be deposited. After receiving funds from GCF, the Facility will transfer the necessary amounts to the Federal Executing Entities from the GCF project account for activities, which will be implemented by the Federal Executing Entity. For regional executing entities, which are sector bureaus, funds will be transferred to the respective BOFEDs on a regular basis. The project finance will be subject to the financial regulations and management including auditing by an independent auditor in line with Auditors General requirements of the GoE. The OFAG adopts international standards on Auditing and financial reporting, which will also apply to this project.
312. Project finance will be disbursed to the executing entities based on approved quarterly Work Plans. Subsequent disbursements will be made based on satisfactory (not less than 75%) settlement of previous advances. The CRGE Facility Finance Officer will clear this before disbursement processing and sending letter of transfer request to the National Bank of Ethiopia. The utilization of funds will be monitored through an internal control framework illustrated under section 7, which depicts the fund transfer and reporting channels; it shows that funds received by MOF in the CRGE Facility are channeled through the Government structure – federal, regional and Woreda – and reported back through the same channels. The Channel One Fund Flow Arrangement is staffed by over 1,000 finance professionals, who will be responsible for fiduciary assurance and facilitation of reporting.

Procurement Management (PM)

313. Detailed annual Project Procurement Plans will be prepared by the Executing Entities. MoIL would utilize Engineering, Procurement and Construction (EPC) contracts to procure turnkey solutions on both power and irrigation schemes. MoIL would internationally tender the EPC contracts by issuing detailed technical specifications and required contractual terms and conditions. MoIL would select EPC contractors that meet the specified technical standards and submit the least cost proposals. To ensure that project operations is seamless and local operational capacity is built, as done in previous similar projects, MoIL may include scope of short-term operations and maintenance of the power plants and/or irrigation schemes by EPC contractors. The ministry reserves the right to terminate the EPC tender(s) if it deems that the EPC proposals submitted by contractors do not meet the minimum technical requirements or don't provide intended value-for-money. The procurement directive has a standardized international and national bidding procedure to ensure that a uniform and competitive bidding process is followed. Price, quality, delivery time and procurement feasibility shall determine the procurement source, modality and delivery mode of required equipment and associated supplies. The project executing entities at all levels are expected to strictly follow the public procurement policies and directives. Each entity is required to prepare bid documents, terms of references and drafting of selection criteria for selection of technicians, technologies, etc. for actions, which it is directly responsible to execute. This means that the selection of technicians and technologies will take place within the broader public procurement policy and the responsibility the mandated entity.

G.4. Disclosure of funding proposal

☒ No confidential information: The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.

☐ With confidential information: The accredited entity declares that the funding proposal, including its annexes, may not be disclosed in full by the GCF, as certain information is being provided in confidence. Accordingly, the accredited entity is providing to the Secretariat the following two copies of the funding proposal, including all annexes:

- full copy for internal use of the GCF in which the confidential portions are marked accordingly, together with an explanatory note regarding the said portions and the corresponding reason for confidentiality under the accredited entity's disclosure policy, and
- redacted copy for disclosure on the GCF website.

The funding proposal can only be processed upon receipt of the two copies above, if containing confidential information.

ANNEXES

H.1. Mandatory annexes

☒	Annex 1	NDA no-objection letter(s) **(template provided)**
☒	Annex 2	Feasibility study - and a market study, if applicable
☒	Annex 3	Economic and/or financial analyses in spreadsheet format
☒	Annex 4	Detailed budget plan **(template provided)**
☒	Annex 5	Implementation timetable including key project/programme milestones **(template provided)**
☒	Annex 6	E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3): **(ESS disclosure form provided)** ☐ Environmental and Social Impact Assessment (ESIA) or ☒ Environmental and Social Management Plan (ESMP) or ☐ Environmental and Social Management System (ESMS) ☐ Others (please specify – e.g. Resettlement Action Plan, Resettlement Policy Framework, Indigenous People's Plan, Land Acquisition Plan, etc.)
☒	Annex 7	Summary of consultations and stakeholder engagement plan
☒	Annex 8	Gender assessment and project/programme-level action plan **(template provided)**
☒	Annex 9	Legal due diligence (regulation, taxation and insurance)
☒	Annex 10	Procurement plan **(template provided)**
☒	Annex 11	Monitoring and evaluation plan **(template provided)**
☒	Annex 12	AE fee request **(template provided)**
☐	Annex 13	Co-financing commitment letter, if applicable **(template provided)**
☒	Annex 14	Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule

H.2. Other annexes as applicable

☒	Annex 15	Evidence of internal approval **(template provided)**
☒	Annex 16	Map(s) indicating the location of proposed interventions
☐	Annex 17	Multi-country project/programme information **(template provided)**
☐	Annex 18	Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
☐	Annex 19	Procedures for controlling procurement by third parties or executing entities undertaking projects financed by the entity
☐	Annex 20	First level AML/CFT (KYC) assessment
☐	Annex 21	Operations manual (Operations and maintenance)
☒	Annex 22	Assessment of GHG emission reductions and their monitoring and reporting (for mitigation and cross cutting-projects)[90]
☒	Annex 23	Knowledge management plan

[90] Annex 22 is mandatory for mitigation and cross-cutting projects.

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** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

No-objection letter issued by the national designated authority(ies) or focal point(s)

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The Federal Democratic Republic of Ethiopia
Environment, Forest and Climate Change Commission

ቁጥር 2/12.1/3406/12
Ref. No.
ቀን 24/6/2020
Date

Green Climate Fund

Songdo Business District

Republic of South Korea

Re: Project Concept Note for the GCF by Ministry of Financeregarding "Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia".

Dear Madam/Sir,

We refer to the project concept note***"Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia"***in Ethiopia as included in the concept note submitted by the Ministry of Financeto us on June 172020.

The undersigned is the duly authorized representative of the Environment, Forest and Climate Change Commission (EFCCC), the National Designated Authority of Ethiopia.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the project concept note as included in the funding proposal.

By communicating our no-objection, it is implied that:

(a) The government of Ethiopia has no-objection to the projectas included in the concept note;
(b) The projectas included in the concept noteis in conformity with Ethiopia's national priorities, strategies and plans;
(c) In accordance with the GCF's environmental and social safeguards, the projectas included in the concept note is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the projectas included in the concept note has been duly followed.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind Regards,

Tirhas Mebrahtu

Director, Resource Mobilization and Project Monitoring and GCF DNA

☎ 251-(0)11-170-40 60
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Addis Ababa-Ethiopia

✉12760
Website: www.efccc.gov.et

Environmental and social safeguards report form pursuant to para. 17 of the IDP

Basic project or programme information	
Project or programme title	Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia
Existence of subproject(s) to be identified after GCF Board approval	No
Sector (public or private)	Public
Accredited entity	Ministry of Finance of the Federal Democratic Republic of Ethiopia (MOF)
Environmental and social safeguards (ESS) category	Category B
Location – specific location(s) of project or target country or location(s) of programme	Kobo Girana in Ahamra Regional State and Borena Zone in Oromia Regional State, Federal Democratic Republic of Ethiopia
Environmental and Social Impact Assessment (ESIA) (if applicable)	
Date of disclosure on accredited entity's website	Friday, September 20, 2024
Language(s) of disclosure	English, Amharic, and Affan Oromo
Explanation on language	Amharic is the official working language of the federal government of Ethiopia. Amharic is a regional and local language in the Kobo-Girana zone, Amhara Region. Affan Oromo is a regional and local language in the Borena Zone, Oromia Region.
Link to disclosure	English: https://www.mofed.gov.et/media/filer_public/3d/6b/3d6b5dc3-e0d8-4cf2-b9c4-df3212250303/annex-6-esamp-gcf-6-aug-2024.pdf Amharic: https://www.mofed.gov.et/media/filer_public/1c/db/1cdb4649-dd33-419b-a65f-3116d89a3cab/annex-6-esamp-gcf-agust_22-2024-amharic_6_sept_2024_misikir.pdf Affan Oromo: https://www.mofed.gov.et/media/filer_public/04/f9/04f955c1-34bd-45c3-93d4-24a1e34c930f/afan_oromo_translation_240919_112344.pdf
Other link(s)	www.mofed.gov.et
Remarks	An ESIA consistent with the requirements for a Category B project is contained in the "Annex 6: Environmental and Social Assessment and Management Plan (ESAMP)".
Environmental and Social Management Plan (ESMP) (if applicable)	
Date of disclosure on accredited entity's website	Friday, September 20, 2024
Language(s) of disclosure	English, Amharic and Affan Oromo
Explanation on language	Amharic is the official working language of the federal government of Ethiopia. Amharic is a regional and local language in the Kobo-Girana zone, Amhara Region. Affan Oromo is a regional and local language in the Borena Zone, Oromia Region.

Link to disclosure	English: https://www.mofed.gov.et/media/filer_public/3d/6b/3d6b5dc3-e0d8-4cf2-b9c4-df3212250303/annex-6-esamp-gcf-6-aug-2024.pdf Amharic: https://www.mofed.gov.et/media/filer_public/1c/db/1cdb4649-dd33-419b-a65f-3116d89a3cab/annex-6-esamp-gcf-agust_22-2024-amharic_6_sept_2024_misikir.pdf Affan Oromo: https://www.mofed.gov.et/media/filer_public/04/f9/04f955c1-34bd-45c3-93d4-24a1e34c930f/afan_oromo_translation_240919_112344.pdf
Other link(s)	www.mofed.gov.et
Remarks	An ESMP consistent with the requirements for a Category B project is contained in the "Annex 6: Environmental and Social Assessment and Management Plan (ESAMP)".
Environmental and Social Management System (ESMS) (if applicable)	
Date of disclosure on accredited entity's website	N/A
Language(s) of disclosure	N/A
Explanation on language	N/A
Link to disclosure	N/A
Other link(s)	N/A
Remarks	N/A
Any other relevant ESS reports, e.g. Resettlement Action Plan (RAP), Resettlement Policy Framework (RPF), Indigenous Peoples Plan (IPP), Indigenous Peoples Planning Framework (IPPF) (if applicable)	
Description of report/disclosure on accredited entity's website	Indigenous People Planning Framework (IPPF) / September 20, 2024
Language(s) of disclosure	English, Amharic and Affan Oromo
Explanation on language	Amharic is the official working language of the federal government of Ethiopia, and the Government uses Amharic and English to communicate government publications (reports, policies, laws, minutes etc.) with the communities in the target areas. Amharic is a regional and local language in the Kobo-Girana zone, Amhara Region. Affan Oromo is a regional and local language in the Borena Zone, Oromia Region.
Link to disclosure	English: https://www.mofed.gov.et/media/filer_public/3d/6b/3d6b5dc3-e0d8-4cf2-b9c4-df3212250303/annex-6-esamp-gcf-6-aug-2024.pdf Amharic: https://www.mofed.gov.et/media/filer_public/1c/db/1cdb4649-dd33-419b-a65f-3116d89a3cab/annex-6-esamp-gcf-agust_22-2024-amharic_6_sept_2024_misikir.pdf Affan Oromo:

	https://www.mofed.gov.et/media/filer_public/04/f9/04f955c1-34bd-45c3-93d4-24a1e34c930f/afan_oromo_translation_240919_112344.pdf
Other link(s)	www.mofed.gov.et
Remarks	The Indigenous People Planning Framework (IPPF) titled "Native Communities Engagement Framework" is included as part of "Annex 6: Environmental and Social Assessment and Management Plan (ESAMP)" section 10, which is the document published on the AE 's websites.
Disclosure in locations convenient to affected peoples (stakeholders)	
Date	Friday, September 20, 2024
Place	**Ministry of Finance/ King George VI St, Addis Ababa, Ethiopia** **Office of Finance of the following project target woredas:** **Oromia Region, Borena** • Arero Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia • Dilo Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia • Dire Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia • Elwaya Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia • Gomole Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia • Miyo Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia • Teltale Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia • Wachile Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia • Yabelo Woreda, Office of Finance, Borena Zone, Oromia Region, Ethiopia **Amhara Region, Kobo-Girana** • Antsokiya Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Eferatana Gidem Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Kewet Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Guba Lafto Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Habru Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Raya Kobo Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Artuma Fursi Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Dewa Cheffa Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia

	• Jilye Tumuga Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Ambasel Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Argoba Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Dessie Zuria Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Kalu Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia • Kombolcha Zuria Woreda, Office of Finance, Kobo-Girana Zone, Amhara Region, Ethiopia
Date of Board meeting in which the FP is intended to be considered	
Date of accredited entity's Board meeting	N/A
Date of GCF's Board meeting	Monday, October 21, 2024

Note: This form was prepared by the accredited entity stated above.

Secretariat's assessment of FP243

Proposal name:	Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia
Accredited entity:	Ministry of Finance (MOF)
Country:	Ethiopia
Project size:	Small

I. Overall assessment of the Secretariat

1. The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
The project is designed to directly enhance the resilience of smallholder farmers and pastoralists in Ethiopia's two least developed regions, which have been significantly affected by climate change. Over 3,300 ha of land will be irrigated, and close to 332,000 community members will gain access to potable water. Additionally, water for over 200,000 cattle will be available even during extended drought seasons. The indirect benefits of this project are expected to reach over 1.75 million community members.	The long-term sustainability of the project relies on the farmers' ability to increase incomes from agriculture and livestock using the water to pay for the operation and maintenance of the solar-powered water-pumping (SWP) systems.
The project employs and establishes sustainable water extraction and usage practices in the design and operation of the water-supply systems using renewable energy. It also promotes direct community engagement in decision-making and the use of both scientific and Indigenous/traditional water-management practices.	The involvement of multiple institutions at the national, regional, and woreda (third-level administrative division in Ethiopia) levels could result in coordination challenges, potentially affecting the timely implementation of the project.
Agriculture is a primary sector contributing to Ethiopia's national gross domestic product and employing 75 per cent of the workforce. However, it remains heavily dependent on increasingly unpredictable rain patterns due to climate change. By providing subsistence farmers with sustainable water sourced from green-energy solutions, the project aims to enhance food security, improve social well-	The project is in conflict-affected areas, which could lead to loss of property and delays.

being, increase income, promote better livelihoods at the farm level, reduce greenhouse gas emissions, improve environmental conditions, and decrease the need for foreign exchange to import fossil fuels.	
The project transforms previous plans of the Government of Ethiopia to develop the groundwater wells with submersible pumps and diesel generators by redirecting the focus to SWP. It also improves the enabling environment for sustainable groundwater use across the country.	
The project's demonstration effect and contributions to an improved enabling environment are expected to scale up the use of solar energy for water supply in irrigation, livestock, and drinking water systems across Ethiopia.	

2. The Board may wish to consider approving this funding proposal in accordance with the term sheet agreed between the Secretariat and the accredited entity, and, if considered appropriate, subject to the conditions set out in annex II to document GCF/B.40/02.

II. Summary of the Secretariat's assessment

2.1 Project background

3. Ethiopia faces significant challenges from climate change, which threatens various sectors of its economy and the welfare of its population. The country is highly vulnerable to extreme weather events, ranking fifth globally in drought risk [1]and experiencing severe impacts from unpredictable and sometimes failing seasonal rains. Historical trends show exacerbated droughts and desertification in lowlands, while highlands suffer from intense, irregular rainfall and erosion. Future projections indicate rising temperatures and uncertain rainfall patterns, increasing the frequency of extreme weather events, which will severely impact water supply, especially in already water-scarce regions like the Rift Valley and eastern pastoralist zones.

4. Water stress is a significant concern in Ethiopia, despite its abundant water resources. Rural areas are particularly affected, with a significant portion of the population lacking access to safe drinking water and sanitation, leading to high rates of waterborne diseases and child mortality. Only 5 per cent of land is irrigated. Ethiopia's agriculture sector, which is vital to its economy, is therefore highly vulnerable to climate change. Agriculture accounts for 40 per cent of the country's gross domestic product, 80 per cent of its exports, and employs 75 per cent of its workforce, yet it relies heavily on rain-fed systems, making it susceptible to climate variability. Prolonged droughts and erratic rainfall patterns lead to reduced crop yields and food insecurity, affecting millions. Climate change also exacerbates poverty and economic disparity, with rural areas facing significant challenges in income, health care, and education.

[1] https://www.frontiersin.org/journals/water/articles/10.3389/frwa.2022.890229/full

5. In the Kobo-Girana Valley and Borena zones (programme target areas), with a large percentage of the population below the poverty line, the traditional farming and pastoral systems are severely impacted by climate change, with increasing droughts, land degradation, and limited access to water, hindering agricultural productivity and livelihoods. The recent instances include losing almost 75 per cent of livestock in the Borena zone during 2021 due to lack of rainfall and increase in the instance of migration and dependence on food aid.

6. Although the government is working on climate-resilient development strategies, including the Ethiopian Climate Resilient Green Economy (CRGE) Facility, significant investments in irrigation infrastructure, modern farming techniques, and renewable energy are crucial to mitigate and adapt to the impacts of climate change, and improve livelihoods. Many rural households lack access to modern electricity services and safe water, both for drinking and irrigation, which has been exacerbated by ongoing drought conditions. The water-pumping for drinking and irrigation is often unfeasible, as operating diesel generators is expensive. While there is a nascent awareness of the potential benefits of using SWP, access to finance and lack of experience have so far constrained uptake in Ethiopia. In the two target project locations, the Government of Ethiopia conducted group water assessment studies, and 349 highly productive groundwater boreholes were identified and drilled for irrigation purposes, but due to a lack of finance only 45 bore wells (13 per cent) are operational. These are all powered using diesel generators.

7. The proposed project will improve community resilience to climate change in two target areas and strengthen the enabling environment for climate-change adaptation and sustainable agriculture. It comprises two main components: community resilience and enabling environment. Community resilience involves the installation of submersible pumps and solar photovoltaic (PV) systems, provision of water for potable use, establishing community-driven operations, and promotion of resilient agricultural production. The enabling environment component includes developing policy and regulatory frameworks; digitalizing measurement, reporting and verification (MRV) and payment systems; creating business models and financing instruments; providing training and capacity development; and facilitating knowledge-sharing and coordination. Furthermore, the project aims to position the intervention regions as models for climate-change adaptation and sustainable water management.

8. Aligned with the United Arab Emirates Framework for Global Climate Resilience from the twenty-eighth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, the initiative directly benefits 355,000 individuals and indirectly benefits 1.75 million. It does this by rehabilitating boreholes with SWP technology, improving irrigation systems, and providing clean drinking water. It aims to reduce emissions by 173,220 tonnes of carbon dioxide equivalent (t CO_2 eq) while providing equitable access to clean water, improving food security, and reducing water-related conflicts. GCF funding is essential due to the limited financial resources for climate adaptation in Ethiopia and the extremely low-paying capacities of the impacted communities.

9. The project will invest USD 50 million in grants, including a USD 5 million contribution from the Government of Ethiopia. Federal ministries of the Government of Ethiopia will oversee the project, with local communities managing it post-implementation through legally established irrigation-user associations (IUAs) and water-user associations (WUAs). These associations, in cooperation with regional bureaus, will manage water schemes, tariffs, and abstraction rates. The Ministry of Irrigation and Lowlands (MoIL) and the Ministry of Water and Energy will lead the development of irrigation infrastructure and water-supply systems. Small revolving funds will be established using the legal structure of rural savings and credit cooperatives (RUSACCOs) in Ethiopia, which will provide reimbursable grants to farmers for investments in sustainable agriculture practices and technologies. The project is classified as category B of the environmental and social safeguards.

2.2 Component-by-component analysis

10. The project establishes partnerships between government stakeholders, communities, and small businesses to implement SWP systems for drinking water and irrigation in Ethiopia's Amhara and Oromia regions. It leverages local agricultural cooperatives for irrigation, focusing on areas like the Kobo-Girana Valley and Borena zone due to their climate vulnerability and groundwater potential. By pioneering innovative financing and implementation arrangements, the project aims to provide universal access to safe water, increase agricultural productivity, and build climate-resilient infrastructure.

11. The proposed project is divided into two components: component 1 involves direct interventions and infrastructure development, while component 2 creates an enabling environment through policy support, capacity-building, and financial mechanisms. The project emphasizes gender inclusion and community participation, aiming to transform conflict-affected and drought-prone areas into resilient, sustainable regions with improved access to essential resources like food and water.

Component 1: Community resilience (total cost: USD 43.3 million; GCF cost: USD 41.34 million)

(a) **Output 1.1**: Solar water pumps installed:

(b) **Output 1.2:** Efficient water distribution system constructed for households, irrigation, and livestock use;

(c) **Output 1.3**: Gender-sensitive IUAs/ WUAs established and capacitated; and

(d) **Output 1.4**: Small Scale Revolving Fund Facility established.

12. Activities for output 1.1. will focus on deploying 100 solar water pumps in the Kobo-Girana Valley and Borena zone, benefiting around 71,240 households by providing water for drinking, livestock, and irrigation. The project will involve comprehensive rehabilitation of existing borewells, including new liners and contamination prevention measures, followed by rigorous water-quality testing. Community-awareness programmes will ensure proper use and maintenance of rehabilitated wells, while regular monitoring protocols will maintain water-quality standards. The procurement and installation of solar PV systems and submersible pumps will be managed by specialized firms, supported by user-fee systems and gender-responsive business models.

13. Activities for output 1.2 will focus on deploying efficient water distribution and irrigations systems, aiming to provide equitable access to water resources for households, irrigation fields, and livestock, while adopting best practices for efficient water use. This includes laying distribution pipelines, storage tanks, and irrigation infrastructure, all optimized for local topography and water-demand patterns. Smart water meters will be installed to monitor water usage accurately, facilitating effective management and conservation. A fair and sustainable payment tariff system will be developed with community involvement, ensuring financial viability, while considering household income and water usage.

14. Additionally, the proposed project will employ irrigation service providers (ISPs) to manage the operation and maintenance (O&M) of the infrastructure. It will ensure availability of at least 25 L per day per capita in line with government goals. Community training sessions will be held to ensure proper O&M of the new systems. Smart meters will monitor usage, and a comprehensive O&M manual will guide ISPs, ensuring the long-term sustainability of the water-supply infrastructure.

15. Activities for output 1.3 will focus on establishing gender-sensitive IUAs and WUAs to promote inclusive governance of water resources. These associations are designed to ensure equal representation and participation. Training programmes will support these associations by

covering governance, financial management, and technical aspects of water resource management. The IUAs/WUAs will play a crucial role in the sustainable management of water resources, regulating water use and minimizing conflicts. Agricultural extension workers will assist farmers in improving farming methods through regular training on modern irrigation techniques and other best practices.

16. Activities for output 1.4 will establish a small-scale revolving fund facility to enhance financial inclusion and support community members in accessing funds for agriculture and ISP O&M costs. Partnering with RUSACCOs, this initiative provides returnable grants for improved crop varieties, livestock, and O&M expenses. Training and capacity-building for RUSACCOs, the inclusion of women and marginalized groups, and the establishment of comprehensive guidelines for fund management are also key components of the project's strategy to ensure long-term sustainability and success.

Component 2: Enabling environment (total cost: USD 2.7 million; GCF cost: USD 1.9 million)

(a) Output 2.1: Relevant regulations, policies, and guidelines created or strengthened;

(b) Output 2.2: Digital MRV and payment system established;

(c) Output 2.3: Gender-sensitive business models and financial instruments identified;

(d) Output 2.4: Local technicians trained on O&M of SWP and irrigation systems; and

(e) Output 2.5: Knowledge-sharing and coordination platform established.

17. Activities for output 2.1 will enhance regulatory frameworks at both national and regional levels to ensure sustainable groundwater abstraction and use. This will involve reviewing existing regulations, identifying gaps, and introducing new policies aligned with best water-management practices. It will also update and strengthen technical quality benchmarks or standards for solar water pump technologies, including energy-efficiency standards for submersible pumps and solar PV systems.

18. Activities for output 2.2 will establish a digital MRV system using digital technologies to enhance the transparency and accountability of water resource management. This includes developing a centralized platform for data collection and analysis, providing real-time data on water usage. The MRV system will be integrated with national frameworks for consistency in data reporting and management. The project also explores using MRV data to implement tiered pricing structures to encourage water conservation and ensure the financial viability of water-supply systems. Digital technologies enable efficient measurement and management of electricity and water use through smart meters, facilitating quantity-based payments and streamlining financial transactions. This enhances transparency, accountability, and sustainability in water resource management, while also mobilizing further results-based climate finance for upscaling the project.

19. Activities for output 2.3 will undertake a comprehensive assessment to identify gender-specific needs and barriers in accessing business models and financial instruments related to water resource management. Based on the findings, the proposed project will develop gender-sensitive business models that account for local gender roles in agriculture and water use. These models aim to improve the participation and economic benefits for both women and men. It also includes training programmes on financial literacy, business management, and entrepreneurship, tailored to women and marginalized groups, and collaborates with financial institutions to create inclusive products like microfinance and credit guarantees.

20. Activities for output 2.4 will undertake a comprehensive needs assessment to pinpoint the required skills and review of existing training resources. It will further develop a tailored training programme focusing on both technical skills – such as system installation, operation, troubleshooting, and maintenance – and soft skills, including communication, problem-solving, and teamwork. These training sessions, which will be delivered in collaboration with academic

and regional institutions, will aim to provide high-quality, hands-on experience and foster the long-term sustainability of the SWP and irrigation systems. Equipping local technicians with the necessary skills and knowledge will help maintain and operate the systems effectively, minimizing the risk of breakdowns and system failures. Additionally, the training creates local employment opportunities and fosters the development of a skilled workforce, which enhances the overall resilience and growth of the target communities.

21. Activities for output 2.5 will establish a knowledge-sharing platform at the CRGE Facility, co-managed by MOF and the Ministry of Planning and Development. This platform will disseminate project results on SWP and community business models, enhancing coordination with national and regional initiatives for scalable climate resilience and water access solutions in Ethiopia's arid regions.

III. Assessment of performance against investment criteria

3.1 Impact potential *Scale: N/A*

22. The project aims to rehabilitate at least 100 boreholes, equipping them with solar-powered, climate-resilient pumping systems, focusing on areas like the Kobo-Girana Valley and Borena zones. It supports improvements in agriculture yields using water, and promote agricultural diversification and sustainability, especially for farmers using agroecology and Indigenous knowledge, as well as modern climate-smart techniques.

23. It will directly benefit 355,236 individuals and indirectly benefit 1,757,752 individuals, totalling 2,112,987 beneficiaries predominantly rural households in Ethiopia, accounting for 1.8 per cent of the national population. At least 50 per cent of these beneficiaries are expected to be female. Direct beneficiaries will include those from households gaining access to clean and sustainable water for irrigation, livestock production, and potable purposes improving their resilience to climate change, thus enhancing food security, livelihood and health. Indirect beneficiaries will benefit from increased employment opportunities and more efficient water use in project areas. Over 200 community members and technical experts will receive training. It also targets significant CO_2 emission reductions, with an estimated reduction potential of at least 173,220 t CO_2 eq over 25 years, contributing to Ethiopia's broader mitigation goals.

24. The project aligns with Ethiopia's nationally determined contributions (NDCs) and national adaptation plan (NAP), aiming to improve potable water access and expand irrigation systems.

3.2 Paradigm shift potential *Scale: N/A*

25. The project aims to overcome barriers that have prevented the uptake of SWP technology in rural Ethiopia, leaving communities without access to safe water for household use and irrigation. By promoting SWP in a holistic manner, integrating access to finance with a strengthened enabling environment, the proposed project enhances agricultural productivity and resilience in drought-prone areas. The initiative seeks to create a market for SWP technology beyond the initial GCF investment, making it more affordable and widely adopted. The project will demonstrate the benefits of SWP through public investment and improve the national enabling environment with policy and regulatory measures, digitalization, capacity-building, and knowledge-sharing. A community-led approach involving IUAs and WUAs will be implemented, aligning with Ethiopia's target to expand modern irrigation from 2 to 20 per cent of agricultural areas by 2030. This will lead to increased productivity and income levels in rural households, ensuring sustainable groundwater use through smart meters and efficient irrigation systems.

26. The project's deployment of SWP technology will raise awareness among local communities, and the enabling ecosystem will contribute to a paradigm shift towards widespread SWP adoption across Ethiopia, in particular when surface water is not available or is too remote to be transported in a cost-effective manner. Key activities that improve the enabling environment will include enhancing the policy and regulatory framework for sustainable water management, adopting digital technologies for water metering and payment systems, and supporting gender-sensitive business models and financial instruments. Training and vocational programmes will build local capacity to maintain and operate SWP systems, adopting water conservation and climate-resilient agriculture practices, while a knowledge-sharing platform will disseminate best practices. This comprehensive approach aims to establish a national ecosystem of service providers and experts, promoting sustainable and inclusive water provisioning systems aligned with Ethiopia's NDC targets and fostering long-term behavioural changes in water resource utilization. Improved knowledge and capacity will support further domestic and international finance mobilization and investments.

3.3 Sustainable development potential *Scale: N/A*

27. The proposed project will significantly contribute to multiple Sustainable Development Goals (SDGs), particularly SDG 1 (No poverty), SDG 2 (Zero hunger), SDG 6 (Clean water and sanitation), SDG 7 (Affordable and clean energy), SDG 8 (Decent work and economic growth), SDG 10 (Reduced inequalities), and SDG 13 (Climate action). By providing sustainable access to clean water and sanitation (SDG 6), the project will address critical gaps in rural areas of Ethiopia, impacting agriculture, health, and overall socioeconomic development. The initiative will also support Ethiopia's goal of expanding solar energy (SDG 7), thereby increasing the population's access to electricity and reducing the energy deficit. This is achieved through investments in solar electricity generation and creating an enabling environment for scaling SWP technology.

28. The project will improve access to water, reducing burden on women and children for water collection. It will create employment opportunities, improve agricultural productivity, and enhance food security, leading to increased income and economic resilience for rural households. Training programmes will empower women and marginalized groups, promoting gender equality and economic inclusion. Health benefits include reduced waterborne diseases and improved air quality, while economic benefits include reliable water supply, reduced disaster-induced losses, and increased local purchasing power. The project also aligns with Ethiopia's climate goals by reducing greenhouse gas emissions, making it a sound investment with substantial returns and long-term community development impacts. The gender action plan ensures women's active participation, enhancing their opportunities and alleviating burdens related to water collection, thus transforming community life.

3.4 Needs of the recipient *Scale: N/A*

29. Ethiopia, a landlocked and culturally diverse country, ranks one-hundred and seventy-third out of 189 countries on the United Nations Development Programme's 2019 Human Development Index. Classified as a least developed country, Ethiopia is eligible for special treatment under international frameworks like the United Nations Framework Convention on Climate Change and the Paris Agreement. Despite some progress, 85 per cent of the rural population lacks access to safe drinking water and sanitation, relying on surface water prone to climate impacts and diseases. In remote rural areas, only 16 per cent of households are connected to the electricity grid, leading to heavy reliance on expensive and emissions-intensive diesel generators for irrigation. The feasibility study highlights significant regional disparities, with nearly all drinking water needs met in Amhara's Kobo-Girana Valley, while the Borena

zone in Oromia is in dire need, potentially benefiting 49,000 households or 230,000 individuals with improved access to drinking water. The national economic situation with recent International Monetary Fund debt-restructuring and economic reforms makes it challenging for the Government of Ethiopia to attract other sources of finance.

30. Ethiopia faces severe economic and environmental challenges, exacerbated by high population growth, ongoing droughts, and the security situation. The country's economic strains include 70 per cent of the population living on less than USD 2 per day, 35 per cent inflation, and a 60 per cent increase in food prices. Water-related conflicts are rising, and Ethiopia ranks fifth globally in drought risk. The high cost of capital, lack of domestic bank financing, and reliance on foreign currency for solar systems further complicate financial stability. Given these challenges, GCF interventions aim to overcome barriers such as access to finance, technical capacity, and awareness, promoting SWP and enhancing climate-resilient access to safe water in the most vulnerable regions.

3.5 Country ownership *Scale: N/A*

31. The project interventions align with its updated NDC, 10-year development plan (10YDP), and key government priorities, particularly those outlined in the NAP. The NAP emphasizes improving access to safe drinking water and enhancing agricultural productivity through modern irrigation techniques, such as SWP. This project, detailed in a comprehensive feasibility study, is crucial for introducing SWP technology in Ethiopia, addressing financial constraints and lack of experience that have hindered its adoption. By focusing on climate-smart agricultural productivity and potable water access, the project supports Ethiopia's vision of becoming a climate-resilient middle-income country by 2025, with an estimated NAP cost of USD 90 billion.

32. Ethiopia's Government acknowledges the significant threats posed by climate change to agriculture and water security, articulating ambitious strategies in its CRGE framework and updated NDC. The new 10YDP sets targets to reduce agriculture's dependence on rain, thereby improving farmers' livelihoods. The MoIL, in collaboration with other ministries and regional bureaus, will implement the proposed project, emphasizing SWP deployment and local community support. The project, supported by the Ministry of Planning and Development and the CRGE Facility, also integrates with national monitoring processes for the 10YDP, NDC, and SDGs, ensuring comprehensive national development and climate resilience.

3.6 Efficiency and effectiveness *Scale: N/A*

33. The GCF cost per tonne CO_2 reduced is USD 42.21 which is on the higher end of the typical range of the GCF portfolio but remains competitive given the project's significant adaptation benefits, including its contribution to increasing climate resilience, water security, and socioeconomic development, and first of its kind efforts.

34. The project requests full grant funding from GCF, which is crucial for its financial viability. The financial internal rate of return remains negative when the grant is replaced with a loan or returnable grants. This sensitivity analysis highlights the project's dependency on grant funding to maintain financial feasibility, particularly given the substantial upfront capital expenditures required to establish the necessary infrastructure for SWP systems.

35. Although the project is expected to generate economic returns in the long term, these returns are not immediate. The delayed nature of these returns presents challenges for debt servicing in the short term, making traditional financing options less suitable. The project's design, therefore, aligns more closely with longer-term development goals, where the benefits accrue over time, particularly as the infrastructure matures and begins to generate consistent

value. In terms of strategic impact, the project addresses significant market barriers and promotes innovation in renewable energy and water management. Its potential for scaling up and replicability in other regions adds to its overall value proposition, offering a pathway to broader regional benefits beyond its immediate scope.

36. Ethiopia, as a least developed country with limited budgetary resources, faces significant local currency risks and severe climate-change impacts. Addressing the urgent need for climate-resilient potable water and irrigation infrastructure, the proposed project requires non-repayable grants for its execution, ensuring climate justice. The financial structure of 100 per cent grants, comprising USD 45 million from GCF and USD 5 million from the Government of Ethiopia, is necessary to cover the high upfront capital costs. The project's efficiency and effectiveness are supported by a comprehensive economic and financial analysis, indicating positive net present value and a benefit–cost ratio greater than one, which signifies its economic viability. Additionally, operating expenses will be covered through revenues from water-use fees, ensuring the project's sustainability.

37. The economic and financial analysis demonstrates the project's strong justification and concessionality provided by GCF. The cost–benefit analysis highlights significant social and environmental benefits, including job creation, improved livelihoods, gender empowerment, and reduced CO_2 emissions through the replacement of diesel-powered pumps with solar-powered systems. GCF concessional finance is crucial for bridging the financial gap for vulnerable communities, enabling the deployment of sustainable technologies, and leveraging additional investments from public and private sources. The project aligns with the strategic objectives of GCF, aiming for transformational impact through innovative renewable energy solutions and climate resilience, with the potential for scaling up and replication in other regions of Ethiopia and elsewhere.

IV. Assessment of consistency with GCF safeguards and policies

4.1 Environmental and social safeguards

38. **Project overview.** The project aims to strengthen the climate resilience in selected drought-prone areas of rural Ethiopia by deploying solar PV pumps for sustainable extraction of ground water in deep aquifers with solar water pumping (SWP) for agricultural production and drinking. By enabling the sustainable use of deep boreholes for irrigation and drinking water, the project will contribute to increasing the adaptive capacity of local communities. The project will finance the rehabilitation of nearly 100 already drilled boreholes which were originally designed for using diesel generators in the Kobo-Girana Valley in Amhara and in the Borena Zone in Oromia. Both are regions with substantial groundwater potential but currently facing severe climate stress and water scarcity. Among the main environmental and social co-benefits, the project expects to improve the access to safe and sustainable drinking water for smallholder farmers in the target areas. The project is also expected to improve the local economy through creating local employment opportunities for rural communities and increased yield and food production.

39. **Environmental and social (E&S) risk category and safeguard instruments.** The project is categorized by the AE as medium risk (Category B) given that the likely environmental and social impacts of the project will be restricted to the project's influence area and are readily addressed through the implementation of mitigation measures. The Secretariat confirms the assigned risk category that is within the E&S risk accreditation scope of the AE. The AE has prepared an Environmental and Social Assessment and Management Plan (ESAMP), which identifies the potential environmental and social risks and impacts of the proposed activities. The ESAMP includes overall mitigation measures and implementation arrangements to develop

site specific risk management plans. The project will generate various site-specific activities related to SWP installation, constructing water distribution system for households, irrigation and livestock uses, and establishing small scale revolving fund facility with various EEs, including government units and communities. As the site-specific activities will be identified and developed during the project implementation with the respective EEs, the ESAMP contains detail guidance to be followed for developing specific safeguards tools for the site-specific activities.

40. Compliance with GCF Environmental and Social Safeguards (ESS) standards. The following paragraphs describe how the project complies with the standards.

41. **ESS1 (Assessment and Management of Environmental and Social Risks and Impacts).** The AE has conducted a baseline assessment as part of the ESAMP to map out the applicable national laws and policies and identified the potential risks and impacts during the implementation and operation phase of the project. The AE has also established mitigation measures tailed to the specific local contexts in the Kobo-Girana Velley and in Borena.

42. **ESS2 (Labour and Working Conditions).** The ESIA contained in the ESAMP has assessed medium to high risk regarding labour and working conditions particularly during the construction phase of the project. It has highlighted the concern regarding construction related worker safety and requires recurrent occupational safety and health protection equipment and measures, trainings and obligations with all contractors to avoid and minimize the risks to workers and public.

43. **ESS3 (Resource Efficiency and Pollution Prevention).** The ESAMP has identified medium to high risks related to the contamination of groundwater sources during the implementation and operation phases of the project, considering the lack of sufficient solid and liquid waste disposal systems in the project areas. The ESAMP identifies mitigation measures to secure and protect the areas around the groundwater sources to limit the risk of pollution. The AE will apply appropriate sanitation measures and put in place appropriate liquid and solid waste disposal systems for towns and the rural communities in the project area. The AE will enforce of the dictates of the Environmental Pollution Proclamation of Ethiopia to ensure that the groundwater quality is not compromised and that it will continue to be suitable for the intended use. The ESAMP also identifies moderate impacts on the environment due to agrochemicals use and requires the project to apply appropriate dosages through the fertigation method of the drip system and adopt an Integrated Pest Management (IPM) approach to avoid and limit the use of agrochemicals and hazardous substances during the operation of the project.

44. **ESS4 (Community Health, Safety and Security).** The ESAMP has identified the potential high impacts on community health considering the need to control and prevent the spread of diseases like malaria through the provision of nets and other items that prevent exposure. The AE will take comprehensive action to prevent and control the prevailing communicable diseases, including through health awareness outreach and the provision of preventive measures and services. The ESAMP has also considered the conflict sensitivity related to migration, given that the number of migrant workers from other parts of the country can increase and lead to conflicts especially in the Raya area, where Kobo-Girana site is situated in the border area between the Amhara and Tigray regions and as such migration can be a cause for conflict. The AE will take recurrent measures to devise approach the socio-economic challenges by implementing capacity development programmes tailored as per the needs of the project, establish financial and credit system and benefit sharing schemes to ensure an equitable and consultative approach to avoid the potential conflicts.

45. **ESS5 (Land Acquisition and Involuntary Resettlement).** Given the SWP rehabilitation will be conducted on the existing boreholes, the AE does not expect any displacement and resettlement of the community during the project development and implementation. However,

as the project will construct the water distribution system for households, irrigation, and livestock use in the targeted areas, involuntary resettlement may arise in the work of constructing pipe network, building up irrigation infrastructure and setting up point collection. The AE has incorporated a Resettlement, Livelihood Restoration and Compensation Framework as part of the ESAMP to enumerate the strategies and approaches to ensure that such potential impacts will be assessed, avoided and mitigated during the project implementation, and that the livelihoods and welfare of project affected people and local communities will be restored. The mitigation measures outlined in the ESAMP include activities such as the participatory land use planning, the conduct of FPIC, and the provision of a grievance redress mechanism. Overall, the project will also not engage in any activities that would trigger compensation rights, and if a potential loss of livelihood is expected, identified or claimed, the project will not intervene in the respective areas. The AE is recommended to initiate and maintain the FPIC process throughout the lifetime of the project with all participating villages, affected vulnerable groups and other stakeholders prior to the implementation of any activities.

46. **ESS6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources).** The ESMAP has identified that there are no protected areas in the project localities and that the project will not trigger this performance standard given the high human settlement in the localities in the past two decades and that there is very little natural vegetation cover in the localities at present. Meanwhile, the ESAMP envisions that in a long term the project will exert pressure on the ecosystem with increasing populations and human settlement expansion. The project will potentially result in the encroachment of ecologically sensitive areas that are outside of the project sites, including the forest reserve in Abware, Fajji, and Gemshat, thereby resulting in reduction of biodiversity. The EMSP also identifies the risks related to deforestation for construction and fuelwood needs, loss of vegetation due to land clearing, and the loss of forestry resources due to the increasing demands for fuelwood, timber, non-timber forest products, and medicinal plants. The ESAMP therefore requires further due diligence on ESS6 through site-specific due diligence checklist and reporting during the project implementation.

47. **GCF Indigenous Peoples Policy and ESS7 (Indigenous Peoples).** The AE has provided a native communities engagement plan as part of its ESAMP. The former plan ensures that the project will adhere to the principles of free, prior and informed consent, underlining the importance of meaningful consultation. Pastoralist communities will have the opportunity to benefit from the proposed project, which promotes the use of agroecology and Indigenous knowledge of water use. In line with their roles and functions, the Indigenous Peoples Advisory Group is available to provide advice to the accredited entity and executing entities.

48. **ESS8 (Cultural Heritage).** The ESAMP does not identify any cultural heritage sites to be restricted by the project and therefore has not triggered this performance standard. However, the ESAMP incorporates risk screening on cultural heritage as part of the site-specific due diligence process to require for a chance find procedure in the case of the presence of any cultural heritage in the project vicinity. The AE is recommended to prepare a standalone chance find procedure for the project as part of the ESAMP as guidance to the followed during the project implementation.

49. **Implementation Arrangements.** As related to safeguards operation, the AE has specific the arrangements and costing for the ESAMP implementation detailing the specific needs during the construction and operation phases of the project for each of the Kobo-Girana and Gelchet-Sarite sites. The project will conduct further due diligence and audit to identify any potential existing and/or associated facilities (e.g. water distribution lines) that require further assessment.

50. **Stakeholder engagement and grievance redress mechanism (GRM).** The project concept and design benefited from a series of consultations launched in early 2021 including engaging with key national government agencies, local groups in Borena and Kobo-Girana for consultation and co-development of the project concept. These consultations were documented

in Annex 7 of the Funding Proposal. The ESAMP outlines the key stakeholders identified, the organization and feedback from the stakeholder engagement activities, and a proposed stakeholder engagement plan to be followed by the AE and EEs throughout the project implementation. The ESAMP requires the establishment of a grievance redress mechanism (GRM) and a complaint register to provide fair, accessible, and effective response to concerned stakeholders, especially any vulnerable group who often lack access to formal legal regimes. The ESAMP also sets out a number of complementary mechanisms for redress, such as to the Kebele Administration, Woreda Administration, and Regional State Administration at the local level (to the M&E and Safeguards Officer), the Regional Public Grievance Hearing Offices at the regional level, and the Ethiopian Institution of the Ombudsman at the federal level. The project also provides access to the GCF Independent Redress Mechanism. In line with the GCF Indigenous Peoples Policy, the GCF Indigenous Peoples focal point will be available for assistance at any stage, including before a claim has been made.

51. **Sexual exploitation, abuse and harassment (SEAH).** The revised GCF Environmental and Social Policy adopted by decision B.BM-2021/18 requires safeguarding from SEAH in GCF-financed activities. The AE has identified risks related to SEAH, specifically in working with the community to train farmers in irrigation, operation, and maintenance. These risks include a lack of awareness about SEAH and how to address it, SEAH risks during project delivery (such as training and placement of irrigation systems), the risk of violence against women due to increased empowerment, and the absence of a reporting system for SEAH-related risks.

52. To mitigate these risks, the AE has developed a women's empowerment and gender equality policy that includes provisions for addressing gender-based violence and will serve as a framework for the ministries, including the MOF. Additionally, the AE will implement prevention measures such as raising awareness about SEAH, collaborating with the Ministry of Women and Social Affairs and its regional and local offices, and incorporating SEAH sessions into project implementation team meetings. A screening process will be used to identify high-risk project activities, and SEAH clauses will be included in contracts with project partners and personnel. SEAH sessions will also be held during community consultations, including women-only consultations, to ensure clarity on reporting incidents and who to contact for support.

53. The AE has established a framework for reporting suspected or actual cases to address SEAH-related grievances. The framework includes a safeguarding team at the project management level and SEAH focal points assigned from the communities, project staff, and women and social affairs staff at the woreda level. Multiple channels will be available for reporting, and the safeguarding team will advise on resolving cases and refer them to the police. The AE will monitor the proper follow-up of reported cases as part of project monitoring. Grievances related to SEAH and gender-based violence within the project will be addressed using the existing grievance redress mechanism (GRM) system. The AE has strengthened the project's GRM approach, which will be accessible for all project-related complaints, including SEAH-specific complaints. The AE outlines a survivor-centred and gender-responsive GRM with specific procedures for SEAH, ensuring confidentiality, safety, and respect for the rights and dignity of all individuals. The ESAMP and the gender action plan cross-reference all SEAH-related risks. The gender action plan includes all SEAH-related activities requiring a budget and budgets for them.

4.2 Gender policy

54. The AE has provided a gender assessment and action plan, therefore complies with the requirements of the GCF Gender Policy. Ethiopia is committed to gender equality and women's empowerment, having put in place policies and institutional arrangements to follow through with the commitments. However, addressing gender inequality and ensuring women's

empowerment also remains a significant challenge within the climate-change mitigation and adaptation.

55. The gender assessment has identified major challenges and limitations in the lives of women to allow them to mitigate and adapt to climate-induced changes. Some of the challenges are limited access to and control overs resources such as land, inputs and finances; limited skills and access and use of information, including that of climate; and limited engagement in decision-making within and outside of their household. This is despite the significant roles and responsibilities played by women in the well-being of family, food preparation, agriculture, pastoral livelihood and food security, and water and energy security to name a few. Fulfilment of these roles is impeded by impacts of climate change, which creates scarcity of water, fuel wood and other resources, while limited support from the enabling environment and sociocultural realities restricting the space for women to thrive. Further, the assessment finds that female-headed households face additional barriers with smaller landholdings and incomes and that they also face labour shortages in utilizing their lands.

56. The project's objective of generating economic and social co-benefits will ensure the increased participation and benefits to women from the sustainable safe water access through solar pumps for irrigation, human consumption and livestock. The governance and implementation arrangement at various levels will make space for more women to play active and decision-making roles; the financial mechanisms to be set up will be gender-responsive and respond to the financial needs of women. The project will ensure the engagement of women through setting quota, targets, criteria, byelaws, in the various interventions such as irrigation, water-user groups, and savings and credit cooperatives. Targeted leadership and technical skills support, financial literacy training as well as targeted outreach and women-only consultations will be held when needed. Further, while business models and financial instruments will be designed to respond to women's needs. Continuous training and capacity development on gender issues is embedded in the action plan, to ensure changes in behaviour, practices and systems of governance, regulatory, financial and business models and systems across all actors. Sociocultural barriers will be women-only discussions, discussions with men and boys, while events and forums will need to take place at times that are convenient also for women.

57. The gender action plan defines activities, indicators, and targets for women's participation and benefit with corresponding timelines and budget. It is expected that a detailed gender assessment will be conducted by the gender specialist together with the regional and woreda gender offices. The findings of the assessment are expected to feed into a revised gender action plan. The assessment will be undertaken with broader stakeholder consultation to better incorporate needs, priorities and opportunities for women and men. The AE is expected to monitor very closely the equal access to financial resources for women as implementation progresses.

4.3 Risks

4.3.1. Overall project assessment (medium risk)

58. The proposed project aims to enhance climate-resilient access to safe drinking water and agricultural productivity in Ethiopia's rural areas through the adoption of SWP technology. The project is designed to have two components: (i) **community resilience:** Deployment of solar PV pumping and irrigation systems for provision of water for potable use and resilient agricultural production by smallholder farmers, and (ii) **enabling environment:** Policy and regulatory framework, digitalization of MRV and payments, strengthening and dissemination of gender-sensitive business models and financing instruments, training and capacity, knowledge-sharing and coordination platform. Total project costs are estimated at USD 50 million. The total

comprises a GCF grant of USD 45 million and USD 5 million grant from MOF for a co-financing ratio of 1:0.1.

4.3.2. Accredited entity/executing entity capability to execute the current project (low risk)

59. The MOF will serve as the AE. It has extensive experience in overseeing financial management and project implementation, currently managing FP058 under implementation in Ethiopia, which has a similar project scope of providing rural communities with water supplies for year-round drinking water and small-scale irrigation to address drought risks and other climate impacts. In late 2012, MOF, in collaboration with the Environment, Forest, and Climate Change Commission, established the Ethiopia CRGE Facility within MoF, which was operationalized in early 2013 to mobilize climate finance. The executing entities (EEs) include MoIL, the Ministry of Water and Energy and RUSACCOs. The national ministries, in this case the EEs, have strong track records in implementing donor-funded projects. The Ministry of Water and Energy has successfully managed projects such as the Ethiopia Urban Water Supply and Sanitation Project (USD 445 million), financed by the International Development Association (World Bank). MoIL has a proven track record in managing large-scale irrigation and lowland development projects, including the Lower Omo Irrigation Project and the Pastoral Community Development Project. RUSACCOS have a track record in managing credit lines and partnering with organizations such as the International Fund for Agricultural Development, the World Bank, the United States Agency for International Development, and the European Union to enhance rural financial systems in Ethiopia, focusing on access to credit and financial literacy.

4.3.3. Project-execution risks (medium risk)

60. **Inflation challenges:** The funding proposal (FP) highlights economic and financial challenges in Ethiopia, such as high inflation, which has escalated the costs of essential goods and services and may affect project execution by increasing the costs of solar equipment and expenses for farmers. The Economist Intelligence Unit operational risk assessment also identifies macroeconomic challenges in the country, including double-digit inflation, the overvaluation of the Ethiopian birr, and liquidity stress in the banking sector, all of which contribute to increased operational costs and complications. To mitigate these risks, funds disbursed by GCF to the AE will be held in a United States dollar account to facilitate direct payments for imported equipment, reducing foreign exchange-related delays. Also, a revolving fund backed by technical assistance will be established to provide farmers with access to affordable financing to invest in modern irrigation. Additionally, the revolving fund's use will be closely monitored and reported annually to ensure it supports agricultural and livestock production effectively and this is captured in the term sheet.

61. **Security challenges:** The FP acknowledges the regional conflict in northern Amhara that could impact project implementation. To mitigate risks, the project will initiate activities in the more stable southern parts of the Amhara region and will enhance collaboration with local stakeholders to ensure security. The AE also emphasizes that it will work closely with the national designated authority to continuously monitor the situation and will halt disbursements if conflicts threaten project safety.

62. **Project viability (and concessionality):** The use of grants (i.e. 100 per cent concessionality) is reasonable given Ethiopia's significant financial challenges, including the need for an estimated USD 316 billion by 2030 to achieve its climate goals, as outlined in the FP. These challenges are compounded by economic constraints like double-digit inflation, an overvalued Ethiopian birr, and banking sector liquidity stress, as highlighted in the Economist Intelligence Unit operational risk assessment. Additionally, the private sector's risk aversion and the lack of suitable financial products limit private investment in critical areas such as

climate adaptation. Given the public good nature of activities like providing safe and clean water to rural communities, grant financing is essential to support these resilience-building efforts.

4.3.4. Compliance risk (medium risk)

63. The project's proposed activities present moderate exposure to the risks of money-laundering and the financing of terrorism, as confirmed by the due diligence assessment performed by the AE. The proposal clearly outlines the flow of funds, which is primarily across the public sector, and the AE has built into the implementation arrangements various layers of accountability and oversight relevant to the risks. In particular, the AE will apply project specific controls, including anti-money-laundering/countering the financing of terrorism (AML/CFT) training to staff, counterparty due diligence, and continuous monitoring throughout the project cycle. The AE has also confirmed that where necessary, it will collaborate with the EEs and the national AML/CFT commission – Financial Intelligence Centre – to safeguard GCF resources for the intended purposes. The AE, in collaboration with the EEs, has also conducted first-level due diligence on subnational stakeholders, including regional, woreda, and kebele-level (fourth level of administrative divisions of Ethiopia) entities.

64. Taking into account these mitigation measures, the final assessment by the AE of residual exposure to the risks of money-laundering/the financing of terrorism and other prohibited practices deriving from the project's proposed activities remains moderate. The Secretariat also maintains this assessment and considers the overall compliance risk exposure to be moderate.

4.3.5. GCF portfolio concentration risk (low risk)

65. GCF has only approved one project so far for MoF, which took place in 2017.

4.3.6. Recommendation

66. It is recommended that the Board consider the above factors in its decision.

Summary risk assessment		Rationale
Overall project	Medium	The funding proposal has an overall risk assessment of Medium based on the issues highlighted. It is recommended that the Board consider the above factors in its decision.
Accredited entity/executing entity capability	Low	
Project-specific execution	Medium	
GCF portfolio concentration	Low	
Compliance	Medium	

4.4 Fiduciary

67. The financial management framework for this project ensures a streamlined and transparent process through the Channel One Fund Flow Arrangement. The GCF funds are transferred to the MOF under the CRGE Facility, which uses a dedicated account to keep the funds easily trackable. For fund disbursement, federal EEs receive direct transfers from the GCF project account, while regional EEs have their funds transferred to the respective Bureau of Finance and Economic Development. Disbursements are guided by approved quarterly workplans, ensuring alignment with project objectives and requiring at least 75 per cent settlement of previous advances before further disbursements.

68. Financial monitoring and control are maintained through an internal control framework that tracks fund utilization across detailed transfer and reporting channels within the government structure. This framework is supported by over 1,000 finance professionals, providing extensive fiduciary assurance and facilitating accurate financial reporting.

69. Project finances will be audited by an independent auditor, in line with the standards set by the Office of the Federal Auditor General, which adheres to international auditing and financial reporting standards. This compliance enhances the credibility and reliability of the project's financial management practices.

70. The financial management framework's strengths include its structured mechanisms, stringent disbursement conditions, and the involvement of a significant number of finance professionals, ensuring comprehensive oversight. To further enhance this robust framework, regular reviews of the internal control system are recommended, along with continuous training and capacity-building for finance professionals. Ensuring timely and detailed financial reporting to all stakeholders will also improve transparency and trust.

4.5 Results monitoring and reporting

71. The cross-cutting programme aims to strengthen rural climate resilience in the Amhara and Oromia regions of Ethiopia through the sustainable extraction of water from aquifers using solar PV pumps. The programme intervention is expected to reduce greenhouse gas emissions by 173,220 t CO_2 eq over the 25-year technology lifespan and reach 2,173,221 beneficiaries (355,236 direct and 1,757,752 indirect) as a result of SWP and new improved irrigation systems.

72. The theory of change diagram adequately explains how the results chain will cascade from the goal statement of the project to the proposed activities and properly integrates environmental, social, economic and gender co-benefits across the results chain.

73. The AE has developed a detailed greenhouse gas emission estimation methodology, which is attached in annex 22 to the funding proposal. The assumptions in the methodological approach are generally transparent, conservative, and aligned with the requirements of the methodology AMS-I.B.: Mechanical energy for the user with or without electrical energy, version 13.0. The assessment of adaptation benefits and beneficiaries is a strength of the funding proposal.

74. Within annex 22, the AE has provided an approach for estimating adaptation beneficiaries of the programme, which provides a description of vulnerability context, and identification of adaptation benefits and related beneficiaries. The direct and indirect beneficiaries are distinguished under a sound assumption. The methodology has allowed a systematic estimation of adaptation beneficiaries, ultimately leading to higher adaptation impact in the communities.

75. Section E.3 of the logical framework has been designed with relevant details, including the inclusion of a robust means of verification, and reporting on the appropriate core and supplementary indicators for the targeted results areas as per the GCF Integrated Results Management Framework. These are found to be adequate and are expected to allow smooth monitoring and reporting of project results.

76. The monitoring and evaluation plan in annex 11 to the funding proposal has been found to follow the appropriate requirements as it includes the entire list of the log-frame indicators, while ensuring consistency between the data/sources and set means of verification. The provided monitoring and evaluation budget is generally aligned with the requirements of the Evaluation Policy for the GCF.

4.6 Legal assessment

77. The Accreditation Master Agreement was signed with the Accredited Entity on 26 January 2017 and became effective on 21 February 2018, which was amended and restated pursuant to a first amendment and restatement agreement which was signed on 30 October 2018 and became effective on 29 November 2018 (the "**AMA**").

78. The Accredited Entity has provided a certificate confirming that it has obtained all internal approvals, and it has the capacity and authority to implement the project.

79. The proposed project will be implemented in the Federal Democratic Republic of Ethiopia ("Ethiopia") in which GCF is not provided with privileges and immunities. This means that, amongst other things, GCF is not protected against litigation or expropriation in this country, which risks need to be further assessed.

80. The Heads of the Independent Redress Mechanism (IRM) and Independent Integrity Unit (IIU) have both expressed that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where the GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by the GCF are made only after the GCF has obtained satisfactory protection against litigation and expropriation in the country or has been provided with appropriate privileges and immunities.

Independent Technical Advisory Panel's assessment of FP243

Proposal name:	Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia
Accredited entity:	Ministry of Finance (MOF)
Country:	Ethiopia
Project size:	Small

I. Assessment of the independent Technical Advisory Panel

1. Ethiopia is highly vulnerable to the impacts of climate change, including more erratic rainfall, increasing temperatures and prolonged droughts, compromising agricultural productivity, and food and water security. Already vulnerable communities are being pushed deeper into poverty.

2. This is a first submission under the standard proposal approval process of the funding proposal titled "Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia". The assessment by the independent Technical Advisory Panel (iTAP) is based on the funding proposal package presented to the iTAP on 6 August 2024 and with revisions to the funding proposal and budget received on 19 August 2024 by agreement with the Secretariat. The assessment has also been informed by a set of written questions and answers further discussed in an online meeting between the iTAP and the accredited entity (AE) on 29 August 2024.

3. The proposed project seeks to enhance climate resilience in the Kobo Girana Valley in Amhara and the Borena Zone in Oromia. By way of solar photovoltaic (PV) water pumping systems, communities are to gain access to water for household/domestic use, irrigation and livestock rearing. The project has two main components. Component 1 focuses on infrastructure development, user associations and the provision of rural credit through a revolving fund that prioritizes smallholder farmers who are most vulnerable to climate change impacts and those with limited access to financial services. Component 2 supports the requisite enabling environment, policy support and capacity-building to sustain, expand and learn from the interventions.

4. Technical and financial assistance is provided by the AE, the Ministry of Finance (MOF, previously named the Ministry of Finance and Economic Cooperation) and the executing entities, namely the Ministry of Irrigation and Lowlands and the Ministry of Water and Energy, along with rural savings and credit cooperatives (RUSACCOs), all in collaboration with regional authorities.

5. This seven-year project has a total budget of USD 50 million, including a requested grant contribution from GCF amounting to USD 45 million. The USD 5 million co-financing is provided by MOF.

6. The iTAP has assessed the funding proposal against the six GCF investment criteria.

1.1 Impact potential *Scale: Medium*

7. Beneficiaries of the proposed project amount to some 2.1 million people (approximately 1.8 per cent of the population of Ethiopia). Direct and indirect beneficiaries include all those gaining from increased water security, extension services and employment opportunities. Details in annex 22 to the funding proposal suggest that in Kobo Girana, some 60 boreholes with solar-powered pumps will be deployed;

8. [1] the project directly targets some 4,500 smallholder farmer households. In Borena, a total of 40 boreholes have been targeted by this project to be powered by solar energy to supply water to the community and livestock and to produce fodder for the livestock.[2] Here, the targeted number of households amounts to over 66,500.

9. The project sites have been strategically selected in vulnerable agricultural areas with existing deep boreholes. Table 1 provides an overview of borehole and pump rehabilitation by target area. The focus of the work is slightly different between the target regions, as the focus in Kobo Girana is mainly on smallholder crop farming, while in Borena the project is directed more towards pastoral communities.

Table 1: Overview of borehole rehabilitation plans, by region (extracted from funding proposal table 2, p.33)

Project target region	Number of rehabilitated sites (minimum)	Average discharge (l/s)	Average pump size (kw)	Types of direct beneficiaries	Main purpose
Kobo Girana Valley (Amhara)	60	50.08	79.8	Smallholder farmers (up to 1 ha land ownership)	Crop irrigation
Borena Zone (Oromia)	40	16.72	37	Pastoralist communities, smallholder farmers, households	Livestock watering, fodder and potable water

10. Water balance studies have been conducted and presented in the feasibility study (annex 2). The groundwater balance analysis contained in annex 4 to the feasibility study suggests that numerous studies conducted in the Kobo Girana Valley have generated relatively reliable hydrological data. Using these to estimate groundwater recharge in the various sub-basins, it is estimated that some 48.84 million m^3 per year will be available for the project without tapping into the existing groundwater reserve, calculated at 2.5 billion m^3. For the Borena region, however, data are limited. The assessment calculates that 4.15 million m^3 (representing less than 1 per cent of recharge) can be safely withdrawn from the Borena basin, leaving a net recharge of 520 million m^3 per year.

11. Cognizant of the importance of sustainable abstraction of groundwater resources, the funding proposal (para. 78) gives the assurance that given shifting precipitation patterns and higher evaporation gradients, the recharge rate of sub-basins will however need continuous monitoring to ensure the sustainable recharge of the groundwater supply. The exact levels of abstraction will be captured through precise metering, a safeguard system that will be put in place to prevent unsustainable abstraction level.

[1] Calculating that some 0.84 ha land could be irrigated on one litre per second of water discharge.
[2] In this area, the design study estimated that some 4.64 ha land could be irrigated for fodder per litre per second of water discharge.

12. The proposed project makes a solid effort to introduce smart water metering systems to monitor and manage water usage. This is very important but captures only part of the equation. It is recommended that the project also set up a system to monitor trends and fluctuations of the groundwater table in the project areas. Through the written question and answer deliberations it was learned that the groundwater levels at each borehole will be periodically monitored by the regional water body authorities. This is encouraging and the iTAP recommends that the results of this monitoring be made part of the proposed project's formal monitoring and evaluation framework (contained in annex 11). This long-term assurance of sustainability is the focus of recommendation 1 in chapter II below.

13. A more immediate matter for the project in ensuring the realization of the intended adaptation benefits for target households could be to elevate the strategic importance of the activities listed under output 1.3. These activities relate to facilitating the formation of Irrigation Users Associations (IUAs) and Water Users Associations (WUAs), development of by-laws, training and technical assistance, all with a focus on gender and inclusivity. In order for IUAs and WUAs to make good use of the water it is critical that they also be involved in the design and technological choices of the water supply and irrigation systems. The design of tariffs and payment systems are equally iteratively dependent upon the selected technical solutions.

14. The implementation schedule contained in annex 5 to the funding proposal presently has the output 1.3 activities starting only in year 3 of the proposed project, by which time all the construction and rehabilitation work should already have been completed. In the same way, activity 1.2.3 (design and refine payment tariff) is also set to start in year 3, indicating that the tariffs will have to be designed to fit a water system that has already been constructed.[3] The iTAP recommends that the AE reorder the activities, so that technical designs and construction plans can be – if not co-created – at least vetted by communities' associations before construction starts (recommendation 2).[4]

15. The project will establish a small-scale revolving fund facility to enhance financial inclusion and support community members in accessing finance for agriculture, and for irrigation service providers to cover operation and management costs. The project collaborates with RUSACCOs to manage this facility, providing returnable grants for the purchase of improved crop, vegetable and animal varieties, and irrigation system maintenance and operations.

16. RUSACCOs are a form of community-based, member-based cooperative financial institutions designed to provide savings and credit services in rural areas. Members pool their savings, and the accumulated funds are used to provide loans to those in need of credit for agricultural activities, small businesses or household needs. RUSACCOs facilitate access to financial resources to those underserved by traditional banking systems. They are recognized and regulated under Ethiopian cooperative laws and operate on democratic principles where each member has one vote, regardless of the amount of their financial contribution. The proposed project's revolving fund anticipates that at least 50 per cent of beneficiaries will be women.

17. To ensure the effective management of the returnable grants, the project provides training to IUA and WUA members through the RUSACCOs on financial literacy and

[3] It should be noted that annex 9 to the feasibility study contains an implementation schedule. The activities, subactivities and their sequencing are slightly different from what is contained in the overall implementation schedule contained in annex 5 to the funding proposal. The partial implementation schedule in the feasibility study suggests that the activity "Design and refine payment tariff model based on actual OPEX [operational expenditures] of assets procured and installed" should start much earlier. Still, it also acknowledges that pricing is to be adapted to the already selected technology. (Activities under output 1.3 are not included in the implementation schedule outlined in the feasibility study.)

[4] Other successful projects have made presentations of different combinations of technologies and costs to communities, allowing the people who have to live with and use these systems to also make an informed choice about an appropriate level of cost and technology.

management skills. The project also establishes clear terms and conditions for the revolving fund, including repayment schedules and eligibility criteria, to promote transparency and accountability. This input – and support to the RUSACCOs – on the organization of the revolving fund is of key importance. Hence, the iTAP recommends that an operational manual be developed to set out the governance mechanisms, eligibility criteria, and terms and conditions for operation, along with a strategy to leverage contributions from other sources to expand and ensure the sustainability of the revolving fund beyond the project implementation period (recommendation 3).

18. The project also seeks to reduce greenhouse gas emissions. The mitigation potential has been calculated by comparing the project scenario against a reference case where groundwater is pumped using conventional diesel pumps. The emission reduction potential of the project is thus estimated at 173,220 tonnes of carbon dioxide equivalent (t CO_2 eq) over the asset lifetime of 20 years (or an annual reduction potential of 6,929 t CO_2 eq).

19. The iTAP notes that the calculated reduction in emissions is based on an assumption that diesel pumps would have been installed for the expansion of irrigation in the target regions, if the project were not to bring solar pumps. This does not, however, exclude the possibility of additional expansion based on diesel pumps occurring in parallel with the project. It can be deemed as uncertain whether or not the anticipated greenhouse gas emission reductions might be counteracted by other increases.

1.2 Paradigm shift potential *Scale*: *Medium to High*

20. The impact/paradigm shift statement in the funding proposal visualization of the theory of change (figure 8, p.23) suggests that "IF access to finance and an improved enabling environment creates a sustainable supply of water for drinking and irrigation to smallholder farmers and livestock adequate institutional, THEN vulnerable groups would increase climate resilience to droughts and reduce carbon emissions, contributing to Ethiopia's NDC/NAP and medium-term development strategy, BECAUSE reliable water access enables vulnerable communities to adopt more sustainable agricultural practices, increasing their productivity, and enhancing their ability to respond to current and future impact of climate change".[5]

21. The iTAP finds that the theory of change statement cited in paragraph 18 above aptly captures the importance of the enabling environment, including the policy, technical and information support and revolving fund to be provided by the Government of Ethiopia. Long-term positive change in the adaptive capacity of a society often depends on building those capacities and investing in the skills of farmers and pastoralists to manage their livelihoods, land and water resources. This is the reason for suggesting the early building and strengthening of WUAs, IUAs and RUSACCOs.

22. Notwithstanding, four fifths of the budget of the proposed project will be consumed by the construction and rehabilitation of boreholes and pumping facilities. Whereas the assumption is for this infrastructure to be maintained (and replaced) and to continue to render benefits beyond a "one-off investment", the likelihood of this happening might have been increased by greater attention paid to local capacities, even as part of the

[5] There is a discrepancy between the theory of change statement in the visualization and the one provided in the text. The text version (section B2a, para. 57, p.19) reads: "IF access to finance and improved adequate institutional and human capacity is provided to fit existing deep boreholes with solar water pumping systems, THEN agricultural productivity and community resilience will increase and contribute to NDC/NAP targets as well as the medium term development plan of Ethiopia BECAUSE reliable water access enables vulnerable communities to adopt more sustainable agricultural practices, increasing their productivity, and enhancing their ability to respond to current and future impact of climate change". Given the emphasis on the infrastructure and technology in this text version, the iTAP would suggest following the version in the visualization, that is, the more "objective-oriented" version found on page 23 and also cited in para 19 above.

construction/rehabilitation exercise. As suggested above, long-term change and paradigm shift would be most likely where local associations are involved early on in defining the way that their farming systems stand to become more sustainable and climate resilient.

23. Nevertheless, the project takes great cognizance of the importance of establishing a fair and sustainable payment system for water supply services (activity 1.2.3, design and define payment tariff for community water supply payments, para. 112 and onwards), which is essential for the project's long-term viability. This activity will involve designing and refining a tariff structure that balances affordability for users with the costs of maintaining and operating the water infrastructure. The tariff system will be developed through consultations with community members, local leaders and other stakeholders to ensure that it is equitable and transparent. The project will also test the effectiveness of the tariff system and gather feedback from users.

24. "Water pricing is new in rural Ethiopia, and the evidence and experience generated by the GCF-supported interventions will be central to further strengthening tariff-setting as a key pillar of replicating and upscaling SWP-based irrigation" (para. 112). It is also noted that the Ministry of Irrigation and Lowlands is currently overhauling the regulatory framework for irrigation and will lead the tariff-setting under the project, on the basis of the regional water laws of Amhara and Oromia, enabling flexible tariff-setting by community-led organizations.

25. It is unclear to the iTAP to what extent tariff-setting for domestic, livestock and irrigation uses are part of the same exercise or are different exercises, which may also be governed by different regulatory frameworks. This does not reduce the importance of the exercise, and the iTAP recommends that the development, adaptation, adoption and testing of pricing models be carefully documented and – as already intended – used for the strengthening of tariff-setting theory and practice in Ethiopia. The iTAP also recommends that particular and additional emphasis be placed on the documentation and learning about tariff-setting and implementation of water pricing with regard to irrigation, livestock and domestic/drinking water uses (recommendation 4).[6]

1.3 Sustainable development potential *Scale: High*

26. The proposed project seeks to produce a range of co-benefits of the massive application of solar PV pumped irrigation.

27. Economic co-benefits expected with the shift to modern irrigation include new job opportunities for trained technicians and potentially in the upscaled crop and livestock production. Greater predictability of inputs (water) should help to reduce the level of "distress" sales of crops and livestock in response to drought. Reliable inputs should also greatly enhance productivity, which can lead to an economic upswing of the whole project area.

28. Environmental co-benefits, including improved local air quality and reduced noise pollution, depend on the extent to which diesel pumps are decommissioned or future planned ones not installed since there is now solar PV pumping. Depending on the agricultural practices engaged in, there is also potential for soil enhancement, multi-cropping and – again depending on the actual irrigation and farming systems to be developed – potential for enhancing biodiversity. To the extent that water productivity and conservation are also enhanced, the risk of groundwater depletion will be lowered.

[6] The a priori tariff estimates in annex 3 beneficially distinguish different price levels for domestic (potable water), drip irrigation, centre-pivot irrigation and livestock water use, but the funding proposal does not reflect any detail on the issue. It should be noted that higher price levels and water payments are of critical importance for equality, efficiency and sustainability of interventions, but also tend to be controversial and may pose challenges for implementation. Hence the importance of informed choices and dialogue between communities and authorities.

29. Gender empowerment is a key objective for many activities of the project. The potential for achieving positive change in this area – including, for example, a revised local-level institutional architecture – may be limited by the fact that the many potentially gender-transformative activities envisaged by the proposed project have only a relatively small share of the budget.

30. The attention paid to gender in the context of the enabling environment, analysing barriers to women in business and the formation of and support to IUAs and WUAs is commendable. Training initiatives are to pay due attention to local languages and delivery methods being gender sensitive and inclusive. This is critical for the by-laws and associations to be representative and serve broad segments of society.

31. An area where gender considerations are not explicitly included in the project proposal relates to the training programmes that will be conducted for local technicians and community members on the operation and maintenance of the pumping/irrigation systems. The Ministry of Water and Energy will lead the training programmes for local technicians, ensuring that they are equipped with the necessary skills for the operation and maintenance of the newly installed systems (which consume nearly 80 per cent of the project budget).

32. It is recommended that the Ministry of Water and Energy, in the process of training and awarding certificates to technicians, consider ways of overcoming gender inequalities and set targets for a proportion or number of women to be trained as technicians (see recommendation 5). As noted in the funding proposal (para. 158), "Strengthening the skills of technical workers ensures the long-term efficiency and operation of the renewable energy and irrigation technology through decentralized availability of qualified technicians". It would be much welcomed if such a robust ecosystem of technicians and grounded expertise to facilitate the effective implementation and expansion of the solar PV water pumping technology across Ethiopia could also be composed of gender-balanced teams.

33. Social co-benefits stand to be greatly enhanced by successful gender-related interventions. The strengthened associations – IUAs, WUAs and RUSACCOs – are expected to contribute positively to the social fabric of the country.

34. Improved access to water for household use should also help to resolve many practical needs for women and girls, who may be expected to carry water for drinking, cooking and their own hygiene needs as well as for boys and men. Reduced water carrying stands to improve women's health and also provide the conditions for reducing the prevalence of infectious disease, and generally improve health and well-being.

1.4 Needs of the recipient *Scale: High*

35. As highlighted in the funding proposal, Ethiopia's precarious economic and environmental situation underscores the urgent need for comprehensive support. Ethiopia ranks fifth globally in drought risk and faces substantial flooding risks, coupled with moderate to very low coping and adaptation capacities (para. 248). Pastoral areas, located in deserts and semi-arid zones, suffer from significant rainfall deficits, and are also subject to severe land degradation due to overgrazing and poor land and water management (para. 59). Ongoing droughts are undermining livelihoods and food security, and exacerbating problems related to population displacement and food aid dependency.

36. Economic strains are severe, with 70 per cent of the population living on less than USD 2 per day, high inflation and macroeconomic instability arising from high external debt and currency depreciation. It has been calculated that 10 per cent gross domestic profit loss has resulted from the economic impacts of climate change.

37. Water-related conflicts are on the rise, with different uses competing for increasingly scarce water resources. Water access is also problematic for a great proportion of the population. The funding proposal (para. 246) highlights that access to clean drinking water varies between and within regions. In 2019/20 about 28 per cent of rural households spent 30 minutes or longer to fetch drinking water (round trip).[7] The feasibility study found that while in the Kobo Girana target area nearly all drinking water needs are satisfied, the pastoralist-dominated and more arid Borena zone is strongly in need of expanding drinking water provisioning systems. Accelerating universal access to water and sanitation and avoiding over-reliance on exposed surface water sources to more resilient sources is a key priority that benefits the most vulnerable populations.[8]

38. The agriculture sector in the Kobo Girana Valley is primarily based on mixed farming, including crop cultivation and animal rearing. Traditional farming systems rely heavily on rain-fed subsistence methods, basic tools and few inputs. Climate change induced factors such as erratic rainfall patterns, temperature variations and crop pest attacks exacerbate the challenges faced by these farmers, leading to low agricultural productivity. Here, the project seeks to enhance food security by reducing reliance on rain-fed agriculture.

39. In the Borena zone, communities rely largely on livestock production for their livelihoods, with a limited crop-livestock mixed farming system. Goats, sheep, cattle, donkeys and camels are the dominant sources of income and basis for livelihoods. Some pastoralists cultivate cereal and pulse crops, owing to erratic rainfall, not all cultivated land is currently productive. In November 2021, some 68,000 animals died and over 1 million animals were in poor condition due to the impact of consecutive droughts in the previous years. Adaptation strategies include supplementary feeding, moving herds to other/remote areas, and seeking other off-farm employment.

1.5 Country ownership *Scale: High*

40. Ethiopia submitted its first nationally determined contribution to the United Nations Framework Convention on Climate Change in 2017, with a revised version in 2021. As explained in the funding proposal (para. 55), the updated nationally determined contribution pledges a significant reduction in greenhouse gas emissions by 2030, aiming for carbon neutrality by that year. This ambitious target, contingent on international support and conducive investment environments, is in turn based on Ethiopia's Climate Resilient Green Economy (CRGE) strategy launched in 2011, focusing on mitigating emissions and enhancing resilience to climate change impacts in agriculture and forestry. The strategy additionally recognizes the interdependence of water and energy and these sectors' pivotal roles in achieving both climate resilience and broader development goals.

41. The proposed project is very clearly aligned with the climate policies of Ethiopia. This alignment should also be continuously ensured by the CRGE Facility Management Committee, chaired by MOF, whose role is to govern and oversee the implementation of the project.

42. The solar-based irrigation approach also constitutes a direct contribution to the Government of Ethiopia's 2030 target of scaling modern irrigation from 2 to 20 per cent of agricultural areas by 2030.[9]

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[7] Ministry of Planning and Development, Ethiopia. 2022. *Ethiopia Voluntary National Review 2022*. Available at https://planipolis.iiep.unesco.org/en/2022/ethiopia-voluntary-national-review-2022.

[8] *Ethiopia 2030: The Pathway to Prosperity: Ten Years Perspective Development Plan (2021–2030).* Available at https://phe-ethiopia.org/wp-content/uploads/2021/04/10_year_plan_english_final.pdf.

[9] As footnote 8 above.

43. The national adaptation plan, as highlighted in the funding proposal (para. 56), "emphasizes the importance of participatory approaches, engaging stakeholders at all levels, including local communities, to ensure inclusivity and ownership in the implementation process". This underscores the need to ensure community contributions and inputs to the design of the irrigation systems and boreholes to be rehabilitated (see recommendation 2).

44. A no-objection letter on the project has been submitted by the Environment, Forest and Climate Change Commission.

1.6 Efficiency and effectiveness *Scale: Medium to High*

45. Ethiopia is a highly indebted least developed country with limited budgeted resources. Nevertheless, the Government of Ethiopia, through MOF, makes a sizeable contribution to the proposed project, including the capitalization of the revolving fund. The USD 5 million contributed by the Government constitutes as much as 10 per cent of the total project budget.[10]

46. The initial capitalization of USD 825,000 for the revolving fund will be allocated by the CRGE Facility within MOF. This amount will be distributed to the regional Bureaus of Finance in Amhara and Oromia to initiate disbursements to community members through the RUSACCOs and support the establishment of the revolving fund facility. The grant facility is available to member IUAs on a returnable basis under agreed-upon terms. The funding proposal estimates that each beneficiary can access up to USD 350 but does not clarify details of the repayment period or whether there are limits to how often beneficiaries can access grants within the project period.

47. The AE has clarified to the iTAP that these details are to be developed through GCF-supported technical assistance under output 1.4, which is intended to support the design and capacity-building of the revolving fund. The iTAP also notes from the AE responses that the operation of the revolving fund is consistent with the principles of Islamic banking, intended to emphasize ethical financing and the absence of interest. This approach will help to ensure that the financial products offered by the fund are accessible to all beneficiaries, including those who adhere to Islamic financial principles. Over time, the project envisages exploring additional funding sources for the revolving fund, including contributions from local governments, private sector partners or other development programmes, but the funding proposal lacks specificities on how this will be done to ensure sustainability of the facility in the long term.

48. Most of the project funding is destined towards the adaptation results area, as indicated in **Error! Reference source not found.**. The iTAP has not been able to follow the detailed c alculations of the proposed project's efficiency ratio.[11] Still, the numbers seem to indicate a relatively high cost (capital expenditure) for the interventions per rehabilitated well and beneficiary household or individual.

Table 2: Estimate of effectiveness of requested funding (extracted and adapted from funding proposal Table 4, page 81)

Result Area	Adaptation	Mitigation
Requested funding (including co-finance)	**USD 42.5 million**	**USD 7.5 million**

[10] The Government co-financing is 10.17 per cent of the total project budget, including the AE fee and 9.53 per cent if the fee is included in the total budget.

[11] In table 4 of the funding proposal, reference is made to annex 10 to the feasibility study, which did not form part of the documentation submitted to the iTAP. Also, the iTAP was not able to identify the origins of all the numbers in annex 3.

Efficiency (ratio)	Average capital expenditure cost • **USD 77,459** per rehabilitated wel[a]l • **USD 645** per direct beneficiary household (potable and productive uses)[b] • **USD 100** per beneficiary household (direct and indirect)[c]	Cost per tonne CO2 eq: **USD 44** (*Considering submersible pumps, solar photovoltaic modules and related equipment*

49. It is, however, also noted that this is a project which should not be judged on its cost efficiency ratio in isolation. The benefits to households participating and targeted by the project stand to be substantial, as suggested by the net economic benefits indicated in Table 2.

Table 2 – Calculation of socioeconomic impacts, by zone and total (extracted from funding proposal table 5, page 82)

Socioeconomic impact	Kobo Girana	Borena	Total project
Total households	4 507	66 540	71 047
Total beneficiaries	22 535	332 701	355 236
Total water supply (m^3)	267 115 669	123 515 459	390 631 128
Total net economic benefit per household (project lifetime, in United States dollars)	90 669	15 781	53 225
Total net economic benefit per household (per year, in United States dollars)	4 533	789	2 661

50. It is argued that substituting the requested grant with (concessional) loans would not be feasible. The funding proposal (para. 264) suggests that "the goal of the project design is to provide sustainable access to safe water services at an affordable cost to these fragile communities. The financial analysis of return on investment clearly shows that the GCF grant cannot be recovered unless water tariffs as the key revenue stream would be substantially increased, to the detriment of local communities."

51. While recognizing the importance of supporting the vulnerable communities in the Kobo Girana and Borena zones, it may still be important to further consider the costs and benefits of the initially favoured irrigation technologies. It is important that the project invest in technologies that are well adapted and supportive of the local economy. Hence the importance of supporting the formation and strengthening of the IUAs and WUAs early on, to allow them to participate in realistic and well-anchored choices of technology and development and testing of pricing structures (see recommendation 2).

II. Overall remarks from the independent Technical Advisory Panel

52. The iTAP finds that the proposed project, "Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia", aligns with GCF funding priorities and demonstrates a solid commitment by the Government of Ethiopia towards enhancing livelihoods and climate resilience of vulnerable communities in the country.

[a] Calculation: USD 7,745,898.53 divided by 100 wells, as indicated in table 4 (funding proposal, p.81), with reference to annex 10 to the feasibility study.
[b] The calculation given in table 4 (funding proposal, p.81) is 42,485,358.72/355,235. It would seem, however, that 355,235 is in fact the number of beneficiaries, that is, the number of households (71,047) divided by 5. (As indicated in the funding proposal, footnote 60, the average household size in Ethiopia is 4.6 persons.)
[c] Calculation basis not specified in (source) table 4.

53. The iTAP recommends that the Board approve this funding proposal.

54. To enhance the sustainability of the proposed initiative, the iTAP recommends that the AE carry out the following:

(a) Recommendation 1: monitor groundwater levels in both intervention areas and include this measure in the project monitoring and evaluation plan (annex 11). The development of the size of the resource is a critical piece of information that is complementary to the information about extraction rates, enabling communities and the government to take necessary action if reduced groundwater levels are detected.

(b) Recommendation 2: re-sequence the order of outputs and activities in the implementation schedule (annex 5) so that the formation of WUAs (activities under output 1.3) precedes and informs the rehabilitation and construction activities under outputs 1.1 and 1.2. This would allow crop choices, economic priorities and broader aspirations of farmer/pastoralist communities to guide the choice of technology and borehole siting. This way, tariffs and payment systems would be developed iteratively with technology, in close coordination with user associations.

(c) Recommendation 3: for the revolving fund, develop (i) an operational manual setting out the governance mechanisms, eligibility criteria, and terms and conditions for operation; and (ii) a strategy to leverage contributions from other sources to expand the revolving fund and ensure its sustainability beyond the project implementation period.

(d) Recommendation 4: develop an explicit strategy for systematizing the learning from the two pilot areas to facilitate the replication and uptake of successful elements to neighbouring zones and across the country. The iTAP recommends that particular and additional emphasis be placed on the documentation and learning from tariff-setting processes and the testing of water pricing with regard to agricultural irrigation, livestock watering and domestic/drinking water uses.

(e) Recommendation 5: review the process of support, training and awarding of certificates to the technicians to be trained in the operation and maintenance of solar PV water pumping and irrigation systems, and consider the possibility of setting a target for a proportion or number of women to be included in the 100 or more technicians to be trained by the project.

Response from the accredited entity to the independent Technical Advisory Panel's assessment (FP243)

Proposal name:	Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia
Accredited entity:	Ministry of Finance (MOF)
Country:	Ethiopia
Project size:	Small

Impact potential

iTAP evaluation: Medium

The Ministry of Finance (MOF) acknowledges iTAP's positive assessment and emphasizes that the project directly targets highly vulnerable populations, especially smallholder farmers and pastoralist communities in the Kobo Girana Valley and Borena Zone. We concur with iTAP's recommendation to ensure that groundwater level monitoring becomes a key aspect of the monitoring and evaluation plan to support sustainable water resource management. We appreciate iTAP's recommendation and will incorporate groundwater monitoring into the project's M&E framework.

Paradigm shift potential

iTAP evaluation: Medium to High

MOF appreciates the iTAP's recognition of the paradigm shift potential of the proposed project. We agree with the recommendation to strengthen the involvement of Water Users Associations (WUAs) and Irrigation Users Associations (IUAs) in the design and decision-making process for water and irrigation systems. We will ensure that activities under output 1.3 are initiated earlier in the project to align with infrastructure development. This re-sequencing will enhance community ownership and ensure that the project's technological solutions are sustainable and contextually relevant. We will do the restructuring of activities under Annex 5 immediately.

Sustainable development potential

iTAP evaluation: High

MOF appreciates the iTAP's high rating for sustainable development potential. The project's emphasis on solar-powered irrigation and community-driven water resource management stands to provide significant co-benefits, including job creation, environmental improvements, and enhanced water access for vulnerable populations. We will place additional emphasis on ensuring gender inclusivity in the training of technicians, as recommended by iTAP, and work closely with the Ministry of Water and Energy to target a proportion of women for technical roles.

Needs of the recipient

iTAP evaluation: High

MOF appreciates iTAP's recognition of Ethiopia's high vulnerability to climate change impacts and concurs with the panel's assessment of the project's alignment with the critical needs of vulnerable populations. The project will address critical gaps in water access and climate resilience, particularly for communities dependent on agriculture and livestock in drought-prone areas. We will prioritize the ongoing evaluation of project activities to ensure that they meet the socio-economic needs of the most vulnerable, as suggested by iTAP.

Country ownership

iTAP evaluation: High

MOF acknowledges iTAP's positive assessment and the strong alignment of the project with Ethiopia's national strategies, including the Climate Resilient Green Economy (CRGE) Strategy and the updated Nationally Determined Contribution (NDC). We fully support iTAP's recommendation to ensure ongoing stakeholder engagement during project implementation and the CRGE Facility Management Committee will continue its work to ensure the project's alignment with national climate policies.

Efficiency and effectiveness

iTAP evaluation: Medium to High

MOF acknowledges iTAP's recognition of the project's significant public co-financing contribution and commitment to financial inclusion through the revolving fund. We will address the iTAP's recommendation to develop an operational manual for the revolving fund within the first six months of the following the entry into force of the FAA to ensure clear governance and sustainability. We will also continue exploring additional funding streams to expand the fund's impact, ensuring that it remains sustainable beyond the project implementation period.

Overall remarks from the independent Technical Advisory Panel:

We thank iTAP for the thorough review and its overall positive assessment. The recommendations provided, particularly regarding groundwater monitoring, sequencing of project activities, and the operationalization of the revolving fund, will be carefully integrated into the project design to ensure its long-term success and sustainability. We welcome iTAP's recommendation for Board approval of this funding proposal.

Gender Assessment and Action Plan

Climate-resilient community access to safe water powered by renewable energy in drought-vulnerable regions of Ethiopia

Contents

Part I: Gender Assessment 3

I. Background and National Context 3

Population 4

Health 4

Education 5

Participation in the formal and informal economy 6

Women in Politics 6

Asset Ownership 6

Land as productive resource 7

Services and Inputs 7

Level of income and wages 8

Norms and Practices 8

II. Gender and Climate Change 10

III. Gender and climate: institutional, legal and policy frameworks 15

IV. Key Gender and Climate Change Issues at Project Sites 20

Raya-Kobo Girana Valley, Amhara Region 20

Borana Zone, Oromia Region 24

V. Sexual Exploitation, Abuse and Harassment 28

VI. Recommendations 30

VII. Conclusion 31

VI. References 33

Part II: Gender Action Plan for Kobo-Girana and Borana 42

Annex I: List of Consulted Individuals 49

Part I: Gender Assessment

I. Background and National Context

Located in the horn of Africa, Ethiopia is home to 105 million people (World Bank, 2019). Over 83% of the population are smallholder farmers, of whom 26% are female-headed households (MoF, 2019). Smallholder agriculture contributes over 85% of total employment, over 90% of foreign exchange earnings, and approximately 50% of gross domestic product (GDP) (Welteji, D, 2018). Smallholder farmers account for 95% of the total area under agriculture and these farmers provide more than 90% of total agricultural output (Welteji, D, 2018).

The country's economic growth and development, as well as the livelihoods of the rural population, are highly dependent on the utilization of natural resources. As a result, growth in the agriculture sector can play a critical role in reducing the poverty rate – a 1% increase in agricultural output leads to a decrease in poverty of nearly 1% (World Bank, 2016a).

Eighty percent of the Ethiopian population currently live in rural areas. Recent rapid economic growth, however, signals the advent of a demographic transition, as urban services and industry are expanding rapidly (World Bank, 2019a). In the past decade, Ethiopia's average annual economic growth rate was slightly over 10%, exceeding the regional average of 5%. In this period, services grew by 12%, industry by 21% and agriculture by 7% (World Bank, 2019a).

Public investment, which increased from 5% of GDP in the early 1990s (Rodrik D, 2016) to 15.3% in 2022 (Terry M et al., 2022), plays a significant part in Ethiopia's growth. More recently, foreign direct investment (FDI) has influenced Ethiopia's growth and the country has attracted about US$ 8.5 billion in FDI (CIA, 2021). The sustained economic growth Ethiopia maintained over the past decade reduced the poverty rate from 30% to 24% between 2011 and 2016 (World Bank, 2019a).

However, in the past two years, the COVID-19 pandemic, desert locust invasions, erratic rainfall that disrupted the country's dominant rain-fed agricultural sector, civil unrest, as well as cholera, measles and yellow fever outbreaks have increased Ethiopia's vulnerability and resulted in enormous disruption to lives and livelihoods. As a result, Ethiopia's economy grew at 6.1% in 2020, compared to 9% in 2019. Remittances declined by 10% in 2020, and Foreign Direct Investment inflows were 20% lower (FDRE, 2021).

Ethiopia is among the poorest countries in the world. The Human Development Index (HDI), which measures average achievements in long and healthy lives, knowledge and a decent standard of living, places Ethiopia in the low human development category: at rank 173 (out of 189 countries), with a value of 0.485. Almost half (48.9%) of the population is multidimensionally poor (UNDP, 2020).

Despite its very low global greenhouse gas emissions contribution (0.04% of global emissions) (Crippa, M. et al., 2019), Ethiopia is highly vulnerable to the impacts of climate change. In the last 50 years, evidence of climate change impacts has become clear in Ethiopia. Temperatures have increased by an average of around 1°C since the 1960s. Annually, 25-50% mean rainfall variations are observed, while occurrences of extreme weather events such as drought and floods have increased in the last ten years. These conditions are expected to further increase the risk of food insecurity, affect human health, result in conflict over scarce resources, put infrastructure at risk and exacerbate environmental degradation. Therefore, sustainable adaptation and resilience measures are crucial to manage vulnerability to climate risks and hazards (FDRE, 2021).

Women constitute half of the Ethiopian population (49.97%) (World Bank, 2020) and 22.1% of the total heads of households (World Bank, 2019b). Almost all rural women are directly dependent on agriculture and environmental resources for their livelihoods and are engaged in productive activities (including crop farming and livestock herding) and the management of natural resources and household assets (AU, 2012).

The major responsibility for household water supply, energy for cooking and heating, and food security falls on rural women; as a result, they are highly affected by drought, uncertain rainfall, and deforestation (AU, 2012). Despite their significant roles, women have long been marginalized or even ignored in major decision-making processes at all levels (MoF, 2019).

Ethiopia has a value of 0.837 in the Gender Development Index, which is the ratio of female to male HDI values; it is in Group Five, which comprises countries with low equality in HDI achievements between women and men. The Gender Inequality Index, which reflects inequality in achievement between women and men in reproductive health, empowerment, and the labor market, ranks Ethiopia at 125 out of 189 countries, with a value of 0.517 (UNDP, 2020).

This gender assessment is carried out to inform the proposed GCF project on the gender roles and power relations observed in the Ethiopian context. It is expected to support the design of the project by taking into consideration the different needs, priorities and knowledge of women and men.

Ethiopia Gender Profile

Population

With a population of 105 million and a population growth rate of 2.85%, Ethiopia is the second-largest country in Africa (World Bank, 2019a). Of the total population, 50% are women, 44% are under the age of 15 and 4% are above the age of 65 (EPHI, 2021). Average household size is 5.2 persons in rural areas and 3.6 in urban areas (CSA, 2020).

Health

Health problems in Ethiopia are largely attributable to preventable infectious ailments and nutritional deficiencies. Infectious and communicable diseases account for about 60-80% of diseases in the country. The health status of people, particularly women, is poor, mainly due to the higher rate of illiteracy and poverty among women, which has hindered their access to health services, information, and decision-making in health matters (JICA, 2006).

The age at which childbearing commences is an important determinant of the health and well-being of a mother and child. In Ethiopia, the median age at first birth among women aged 25-49 is 18.7 years (EPHI, 2021). The 2020 gender inequality index shows that, in Ethiopia, there are 66.7 births per 1,000 women aged 15-19.

Family planning is essential for women to avoid unplanned or unwanted pregnancies and prevent unsafe abortions. Additionally, contraceptive use enables women to space the births of their children, which benefits the health of the mother and child. The 2019 mini demographic and health survey showed that 96% of married women aged 15-49 know at least one method of contraception. The contraceptive prevalence rate in 2019 was 41% and has steadily increased from 14% in 2005 (EPHI, 2021).

Health care services during pregnancy and after delivery are yet another important factor for the survival and well-being of both the mother and the infant. Skilled care during pregnancy, childbirth and the postpartum period is critical in reducing maternal and neonatal morbidity and mortality. The 2019 survey shows that 74% of women aged 15-49 received antenatal care from a skilled provider, which has increased from 62% in 2016. Further, 48% of births occurred in a health facility, a fraction that has increased from 26% in 2016 and just 5% in 2005. The gender inequality index of 2020 shows that the mortality ratio for Ethiopia is 401 maternal deaths/100,000 live births, which needs considerable improvement to meet the SDG target of 70/100,000 by 2030. Although institutional delivery has been promoted in Ethiopia, home delivery is still common, primarily due to distance, scarce transport, and lack of appropriate facilities (EPHI, 2021).

Twenty percent of women aged 15-49 and 38% of men aged 15-49 have comprehensive knowledge of HIV. The national HIV prevalence rate is 1.2% for females and 0.6% for males (CSA, 2017a). With regard to female genital mutilation (FGM), 65% of women aged 15-49 (a decrease from 74% in 2005 and 80% in 2000) are circumcised. Among women who have heard of female circumcision, 24% believe that the

practice is required by their religion and 18% believe that the practice should be continued (CSA, 2017a). Though a lot of progress has been observed since a national strategy and action plan were developed in 2013 to address harmful traditional practices, it is evident that more work is needed in raising awareness and taking actions to eliminate the practice of FGM (MoWCYA, 2013; CSA, 2017a).

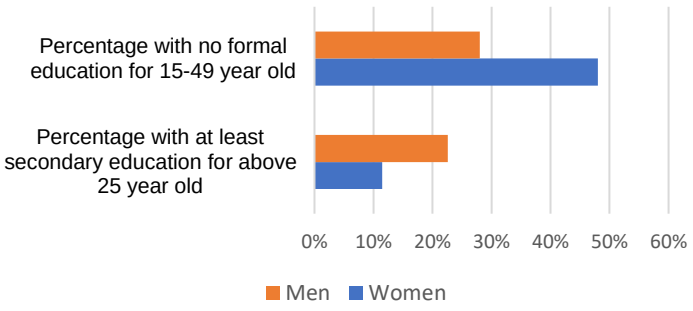
The 2019 EPHI survey clearly indicates that most of the positive outcomes on women's health indicators are higher for women in urban areas and for those that have at least a secondary education. This is a clear indication that a focus on education can significantly improve the health of both women and men in Ethiopia.

Education

Literacy is key in equipping the workforce with skills. Participation in a broader range of business, including more profitable and high-value-added sectors, depends on technical and vocational skill development (Hallward-Driemeier, M., 2013). Education is strongly linked with socioeconomic variables such as lifestyle, income, and fertility.

The gender development index of the 2020 Human Development Report indicates that the mean year of schooling in Ethiopia is only 1.7 years for females and 4.3 for males, while the 2020 gender inequality index shows that only 11.5% of females and 22.6% of males above the age of 25 have at least some secondary educations (UNDP, 2020).

Fig. 1: Percentage of men and women with no formal education and with at least secondary education



Source: CSA, 2017a; UNDP 2020

A survey conducted in 2016 shows that men are better educated than women in Ethiopia. About half of women (48%) and 28% of men aged 15-49 had no formal education. Urban women complete a median of 7.7 years of education, while the median among rural women is 0. The corresponding figures among men are 9.3 and 2.9 years. Additionally, 48% of women are literate, as compared to 69% of men (CSA, 2017a; EPHI, 2021).

In 2019, 35% of females attended some primary schooling, 6% completed primary education, 11% had some secondary schooling and 7% completed secondary school or had more than a secondary education. The percentage of women with no education fell from 75% in 2000 to 48% in 2016 and 40% in 2019 (EPHI, 2021).

Most individuals learn literacy skills through the formal education system, for which attendance has increased in the past two decades, especially for girls and women (CSA, 2017a). Between 2000 and 2016, the gender parity index, or the ratio of female to male primary school attendance, increased from 73% to 99%. Age-specific attendance rates for the population aged 5-24 show that 70% of children attend school by age 7, while between ages 8 and 13 more than 60% attend school. The attendance rate declines rapidly from age 16-24 and during these years attendance is higher for males than females (CSA, 2017a).

The median age for a mother's first birth in Ethiopia is 18.7 years (EPHI, 2021). Women who give birth in their teenage years are more likely to drop out of school, and throughout their childbearing years they will continue to grapple with decisions related to fertility, motherhood, and the labor market (CSA, 2017a).

A report on adult learning shows that due to a persistent share of older, illiterate cohorts, overall gender literacy gaps remain wide while younger cohorts' gender literacy gaps are decreasing. Adult and non-formal education programs are being made available to cater to this generation of women. Children and adults ages 15 and up may enroll in Adult Literacy Training to learn literacy skills, while any adult may enroll in

community skills training centers to learn basic literacy, numeracy and other entrepreneurship and trade-related skills via regionally governed centers (MoE, 2008).

The gender gap in adult education is wide: while 70% of illiterate men are enrolled in adult education programs, only around 40% of illiterate women are enrolled in such programs, since women are likely to experience more time and social constraints with age relative to men. In order to facilitate women's involvement in continuing education programs, it may be effective to offer financial incentives to offset time costs associated with attendance and travel (UN Women, 2014).

Buehren, N. and Salisbury, T.V., 2017 find that education facilities may fail to offer girls and women a safe, accessible and gender-sensitive environment. Therefore, initiatives that reduce distance to learning centers, provide safe transportation, provide female instructors or those that are attuned to the needs of female students and inviting boys and men into discussions on cultural and societal practices are essential to increase the participation of girls and women.

A study undertaken in Malawi and Uganda shows that when women's schooling increased, women's ideal family sizes decreased: a one-year increase in schooling was associated with a 0.34 drop in women's ideal family size. As such, women's education can influence women's economic activity by improving skills development, reduction in fertility rate and increasing the amount of time women can contribute to the labor market (Behrman, 2015).

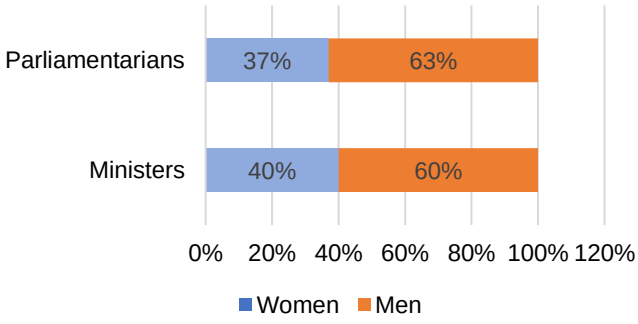
Participation in the formal and informal economy

According to the Ethiopia Socioeconomic Survey (ESS) of 2015-16, gender serves as a strong predictor of workforce participation in Ethiopia. A simple average indicates that women are 17% less likely than men to participate in the labor force. This difference widens to 29% when considering other factors such as age, education, and household wealth. A gender gap of 4.4 hours exists among individuals active in the workforce; while men work 31 hours per week, on average, women work only 27 (World Bank, 2019a).

Women in Politics

According to 2021 women in politics data, Ethiopia ranks 25 (out of 182) for women in ministerial positions with a score of 40% (8 out of 20), while the country ranks 31st for women in parliament. Of the 700 seats in the federal Parliamentary Assembly (House of Peoples' Representatives and House of Federation), 37% are held by women. This is higher than the sub-Saharan African average of 24.9% and the world average of 25.5% for women in parliament. Ethiopia is also among the 9 countries (5.9%) globally that have a woman head of state (UN Women, 2021).

Fig. 2: Percentage of women and men parliamentarians and Ministers



Source: UN Women, 2021

Access to Resources

Asset Ownership

Assets such as land and business equipment serve not only as essential inputs, but also as potential collateral for credit. Half of all women in Ethiopia own a house in part or in full, while 40% of women own land. Of the women who own land, half report having their name on a title deed (CSA, 2017a). However, relative to men and male-headed households, women and female-headed households fare worse in land and asset ownership. Compared to female-headed households, male-headed households have larger plot sizes, a larger proportion of cultivable land and a larger fraction of registered land. Women in male-headed households are very rarely primary land managers, though the reverse is not the case for men in female-headed households (World Bank, 2019a).

Land as productive resource

According to the Ethiopia Socioeconomic Survey (ESS) of 2015-16, 74% of female farmers are widowed, divorced, or separated. In addition, on average, they have smaller household size, are five years older and are more likely to be illiterate – 88% for females vs. 59% for males (World Bank, 2019a).

Rural households, on average, own 1 hectare of land; while, on average, male-headed households own 1.12 ha, female-headed households own 0.6 ha (CSA, 2020). Further, even though women make up more than 40% of the agricultural labor force and head approximately 25% of all farming households, they have less access not only to land but also to other factors of production than men (World Bank, 2019a). In terms of gross value of output, female farmers produce 23% less per hectare than male farmers. In addition, women see lower returns to their time spent on agricultural activities, extension services received, and use of fertilizer and oxen compared to their male counterparts (O'Sullivan M. et al., 2014). The fact that female farmers grow a narrower range of crops further widens the gender gap in productivity (World Bank, 2019a).

These lower returns point to broader social norms, market failures and institutional constraints that prevent women's resources from translating into the same levels of agricultural productivity as they would for men (World Bank, 2019a). Addressing these challenges is a necessary step to fulfill ambitious targets, such as those set in the national Ten-Year Development Plan – including securing the rights of the 60% of women who are not given land rights (FDRE, 2020).

Services and Inputs

Extension services

Smallholder farmers access information about new technologies and other farm-related information through agricultural extension services. However, female farmers are less likely than male farmers to attend extension programs. In 2015-16, 23% of female farmers attended extension programs compared to 38% of male farmers. This means women are less exposed to, and aware of, new techniques, farming knowledge and management practices. Though policies have recognized the need to close the gender gap, identifying and addressing constraints still remains a challenge (World Bank, 2019a).

Formal credit

Credit and other financial services can provide small-scale farmers with the opportunity to improve farm productivity and transition from subsistence farming to large-scale and commercial farming (Mukasa A. N., 2017). Credit can, in the short term, help farmers increase their purchasing power to acquire necessary production inputs and finance their operating expenses, while in the long run it can help farmers to make profitable investments (World Bank, 2019a). Female farmers are, however, 9 percentage points less likely to live in a household with access to credit than male farmers (Mukasa A. N., 2017). Reasons include the fact that women are less likely to own and control physical assets that serve as collateral and they have lower levels of human and social capital which, in turn, can reduce their eligibility for formal credit. When credit is constrained, farmers are likely to use sub-optimal levels of productive inputs, thereby limiting their productive capacity (Mukasa A. N., 2017).

Production inputs

Modern agricultural inputs, such as fertilizers, pesticides, herbicides, and fungicides, are used to increase agricultural productivity and protect farmers against harvest fluctuations linked to pests, adverse weather, and soil degradation, and thus mitigate crop losses. Female farmers use 2 percentage point lower levels of these agricultural inputs than their male counterparts, which limits productivity and may imply greater vulnerabilities to shock-induced variations in production. Reasons vary from these products being typically sold in large quantities, requiring a sizable upfront cost that cash-constrained women may struggle to afford, to mobility where limited transport options are available that affect access to both inputs and markets (World Bank, 2009a).

Access to Irrigation

Although studies show most projects target both women and men farmers, women still benefit much less from irrigation programs due to lower access to information, including training (Likimyelesh, N. et al., 2017, FDRE, 2007). Men mostly control the use of irrigation technologies and have more control over income from these technologies (Likimyelesh, N. et al., 2017).

Level of income and wages

In 2009, the average wage in Ethiopia was only one-third of the Sub-Saharan African average and less than one-half of the global average for low-income economies. In 2012, the monthly average real income was ETB 421.70 (USD 23.40), less than USD 1.25 per day (Tadele, F and Shiferaw, K., 2015). Low levels of productivity and investment likely contributed to stunted wage growth (World Bank, 2009b).

Both formal and informal sector analysis indicates that female employees earn 44% less per hour than their male counterparts. This disparity drops to 36% when individual-, household-, and job-level characteristics are taken into consideration (World Bank, 2019a).

The gender wage gap is partly explained by gender differences in education, experience, and training (Arbache J. S. et al., 2010). Secondary and post-secondary education help individuals to develop more advanced skills to garner higher wages. Data show that employees who hold a bachelor's or postgraduate degree, have, on average, a 50% higher hourly wage relative to individuals who only completed secondary education, and a 20% higher wage than those who only completed their primary education (World Bank, 2019a).

Furthermore, women's limited labor market skills pigeonhole them into jobs concentrated in low-profitability sectors, with more women working in informal wage employment than men (Arbache J. S. et al., 2010). 37% of women report seasonal employment and 13% report occasional employment (CSA, 2017a). These trends of irregular employment contribute to women's limited on-the-job training, fewer professional development opportunities, and a perpetuation of disparities in skill sets, job opportunities and wages (World Bank, 2019a).

Norms and Practices

Shared beliefs or informal rules about which behaviors are appropriate, typical, or desirable in a particular social group are referred as social norms (Padlock E.L. and Ball L., 2010). Although norms do not dictate behavior, they influence the likelihood of particular behaviors by establishing expectations of rewards and approval or, conversely, sanctions and disapproval. Gender norms arise from, and give basis to, the belief that men and women are, and should be, different in behavior, aspirations, status, and economic activity (Cech E.A., 2013). Norms influence everything from educational investments early on in life, to factors later in life such as the timing and dynamics of marriage, childbearing, household dynamics, asset ownership and internalized beliefs (Paluck E.L. and Ball L., 2010).

Marriage and Childbearing

Marriage in Ethiopia occurs early in life, with the median age at first marriage for women standing as the lowest in Eastern Africa at 17.4 years (Clark S. et al., 2017). Both social norms and economic pressures may result in early marriages. When norms emphasize women's role as mothers rather than providers, girls may be motivated to move into adulthood through marriage and motherhood rather than through education and employment. In cases where norms emphasize virginity, marriage in adolescence is encouraged. Economic pressures also motivate marriages, leading parents to arrange their daughters' marriages in order to escape poverty at home. Women who marry early are more likely to drop out of school earlier and less likely to spend time acquiring valuable skills for economic success. Therefore, delaying marriage may result in better educational and economic outcomes for women in Ethiopia (World Bank, 2019a).

Career and Family

Women may be forced to avoid job opportunities that will minimize the time they can give to caring for family members and the household. Such choices will impact lifetime earnings and contribute to the gender gaps in wages and profits (World Bank, 2019a).

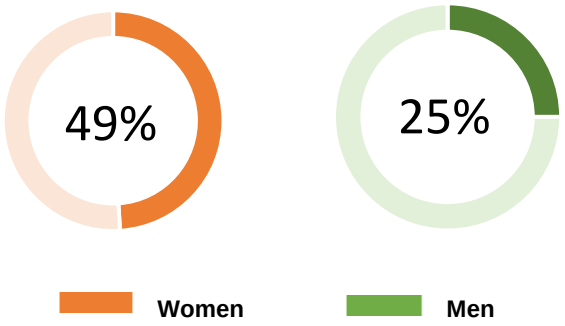
Further, women experience an increasing trade-off between career and family as they enter roles with higher pay and responsibility, in part discouraging women from aspiring to particular occupations or positions. In Ethiopia, a study of large companies, including Ethiopian Airlines, Ethio-Telecom and NIB International Bank, found that female business leaders experience intense "work overload" attributed to their "inability to say no, the nature of their company and their work, and the imbalance of their responsibility and their required working hours" (World Bank, 2019a).

Intra-household Dynamics

In Ethiopia, the majority of domestic work is delegated to women, including child rearing, cleaning, food preparation, wood and water collection, and food production. Ethiopian women aged 18-19 spend 4.1 hours per day on domestic tasks, compared to 1.5 hours for boys of the same age (A. Pankhurst et al., 2016). Women are much more likely than men to spend time collecting water and fuel wood; about 49% of female household members engage in these activities daily, compared with only 25% of male members (CSA, 2020).

In addition, many studies document the large amounts of time women devote to agricultural and livestock production. In Oromia, Amhara and SNNP Regions, for instance, women divide their time between agricultural and domestic tasks and spend about 14 hours a day on both productive and domestic activities, compared to an average of 10 hours spent by men (Agajie, G. and Derese, T., 2011). According to UN Women, women contribute as much as 70% of on-farm labor in post-harvest activities for cereals and take on 60% of marketing activities .

Fig. 3: Percentage of household members collecting water and fuelwood daily



Source: CSA, 2020

These responsibilities hinder women's opportunities to study, develop professional experience and skills, run a business, or engage in paid work: 16% of girls drop out of school to look after siblings and 12% of girls drop out of school due to family issues (Frost M. and Rolleston C., 2013).

Internalized Beliefs

Women's and men's subjective self-assessment capabilities contribute to gender gaps. Ethiopian gender gaps in self-assessed ability are clearly seen for tasks typically performed by only one gender or tasks for which either men or women have a perceived natural advantage. On the other hand, when gender is said to be irrelevant to the task, men and women show no difference in self-perceived competence (World Bank, 2019a).

Violence against women affects a woman's physical and mental health, as well as her ability to engage in daily activities. Fear of violence can also reduce women's willingness to pursue economic activities, especially activities uncommon for women. In Ethiopia, one in ten women report having experienced sexual violence while one-third of ever-married women have experienced spousal violence (CSA, 2017a). 63% of

women and 28% of men agree that a husband is justified in beating his wife for activities such as burning food, going out without permission, neglecting children, or refusing to have sex (CSA, 2017a).

II. Gender and Climate Change

Although climate change is global in its extent and impacts, Africa has been identified as highly vulnerable to climate change due to low adaptive capacity and high reliance on climate-sensitive sectors such as rain-fed agriculture (Gebrechorkos, S.H. et al. 2019; Girvetz, E. et al., 2019). Rainfall variability and increasing temperatures are the two most important variables of climate change, imposing a negative effect on the productivity of the agricultural sector and sustainable economic development in Africa, particularly in sub-Saharan African countries (Serdeczny, O. et al., 2017; Abera, K. et al., 2018; Asfaw, A. et al., 2018; Gebrechorkos, S.H. et al., 2019).

Despite its very low global greenhouse gas emission (0.04%) contribution (Crippa, M. et al., 2019), Ethiopia is one of the sub-Saharan African countries that is highly vulnerable to the impacts of climate change and variability (Birara, H. et al., 2018).

In the past 50 years, evidence of climate change impacts has become apparent in Ethiopia. Recurrent droughts, combined with changes in the amount and spatial distribution of seasonal and annual rainfall, are among the major climate-related developments evident in Ethiopia (Zeleke et al., 2017; Weldearegay, S.K. and Tedla, D.G., 2018).

Agriculture in Ethiopia is predominantly dependent on rainfall. Therefore, any variation in rainfall amount, distribution and trends will have a direct impact on agricultural production and thus significantly affect the lives of rural smallholder farmers who depend largely on agriculture as their main source of income (Desalew, M.M. and Bhat, H.G, 2021).

A study by Solomon, R. et al. (2021) on agricultural productivity change induced by climate change up to the year 2050, finds that, at national level, crop production will be adversely affected during the coming four decades, with increased severity over the time period. As a result, food prices will be higher and this will lower Ethiopian GDP growth, reduce real household incomes, and adversely impact consumption. Overall, the study indicates that climate change will cause the loss of 31% of agricultural GDP by 2050. Poor, rural households will be more affected than urban and rural non-farming households. Since agriculture has linkages with other sectors, an impact on the agriculture sector will also adversely impact the agro-processing, industrial and service sectors. The value of exports and imports will fall by 36% and 32% in 2050, respectively. Therefore, the need to mainstream adaptation measures to sustain the overall performance of the economy is of paramount importance. The key recommendations of the study are increasing the use of irrigation and infrastructure development, building human capital, especially the skills of farmers, and integrated policy options, including changes in modern technology and enhanced awareness to adapt to adverse climate change impacts.

Another study done in the Rib Watershed, northwestern highlands of Ethiopia, indicate that both seasonal and annual rainfall patterns across the watershed vary extremely and exhibit high temporal and spatial variability (Desalew, M.M. and Bhat, H.G, 2021). Most parts of the watershed have experienced high variability or less reliability of rainfall over the last few decades, notably with higher variability of Belg – short rainy period (March-May) rainfall in the watershed than Kiremt – the main rainy season (June- September). Projections by the study suggested that the Kiremt rainfall will probably increase by 20-25% by 2050 relative to the baseline period (1986–2017). However, the Belg rainfall is projected to decline by 4.8-8%.

A greater warming trend for both current and future scenarios was observed in the Rib watershed. The mean annual temperature in the study area has increased by 1.07°C over the last four and a half decades, with an average rate of 0.24°C per decade (Desalew, M.M. and Bhat, H.G, 2021). Similar results were found in Lake Tana sub-basin (Abera, K. et al., 2018) and Tekeze basin (Fikru, F. et al., 2018).

A high concentration of rainfall over a few months – particularly in July and August, which accounts for more than 50% of total Kiremt rainfall – results in more frequent flood events and soil erosion, thereby posing a threat to agricultural production (Desalew, M.M. and Bhat, H.G, 2021). Flooding and waterlogging result in anaerobic stress in roots, which significantly reduce crop yield (Fiwa, L. et al., 2014) while, at the same time, affecting the quality of grazing lands and irrigation facilities in the downstream watershed (Maharjan and Joshi, 2013). Excessive rainfall also leads to a high rate of surface runoff and soil erosion that causes the loss of fertile topsoil in the high slope areas and sedimentation in low slope areas in the absence of proper soil conservation structures (Fiwa, L. et al., 2014). Loss of soil fertility consequently leads to losses in agricultural production and rural livelihoods.

Increases in growing season temperatures may also adversely affect crop production, farm income and food security in many ways, especially when combined with high inter-annual and intra-seasonal variability of rainfall. The projected warming will reduce the grain yield of cereal crops, which are already experiencing significant reduction due to human-induced soil erosion (Desalew, M.M. and Bhat, H.G, 2021). An increase in temperature significantly affects mean yield responses, as well as yield variability, of maize, millet, and sorghum (Maharjan and Joshi, 2013). Heat stress also reduces grain yield by increasing evaporation and reducing water availability (Hatfield and Prueger, 2015), particularly in low rainfall-receiving downstream areas.

The challenges of having a high concentration of rainfall in Kiremt season, while other months remain dry or receive little rain, is that farmers in the watershed are unable to grow food crops more than once on their small parcel of plots in a given year, which leads to food insecurity and poverty (Desalew, M.M. and Bhat, H.G, 2021).

A projected increase in annual and seasonal rainfall would have mixed implications for future agriculture. On the one hand, it could contribute to future agriculture under proper soil conservation practices to control associated impacts such as flooding, excessive runoff, and soil loss. On the other hand, unless properly managed, the projected increase in Kiremt rainfall will lead to excessive flooding, runoff, and soil loss, thus contributing to a reduction in overall agricultural yields (Desalew, M.M. and Bhat, H.G, 2021).

Livestock production is also very important in supporting rural livelihoods. It contributes about 17% of the gross domestic product (GDP) of Ethiopia and 39% of the agricultural GDP (Shapiro, B. et al., 2017). However, livestock management is often inefficient in Ethiopia, with low and unreliable returns that leave many livestock-producing households in poverty (Rettberg, S. et al., 2017).

Approximately 60% of Ethiopia's lowlands are arid or semi-arid and Shapiro, B. et al. (2017) estimate that 60 million ha of rangelands are grazed in Ethiopia and that livestock consume 120% of the annual forage production in average weather years. The forage deficits are higher in drought years and have been aggravated by increasing livestock populations. As a result, livestock productivity per animal has declined.

Rettberg, S. et al. (2017) report that most of the rangeland in Ethiopia is already degraded and has sparse vegetation. Herders in arid and semi-arid areas have traditionally moved livestock to deal with droughts. However, the ability to move livestock to different areas is diminishing and there is a pressing need to develop other approaches to reduce animal mortality rates and support production during droughts. The Government of Ethiopia has encouraged voluntary settlement of pastoralists and communal rangelands are being increasingly enclosed and privatized. As a result, the future productivity of livestock and crop production in the Ethiopian lowlands is highly vulnerable to land degradation from overgrazing, as well as from climate variability and change (Ng'ang'a, S. et al., 2020).

A study done on the health of Hamer pastoralists shows that the biggest climate challenges they are facing are reductions in rangeland, erratic rainfall, recurrent droughts, and loss of seasonality (Samuel, L. et al., 2021). Communities are travelling greater distances to access sufficient grazing lands, and this is leading to livestock deaths and increased ethnic violence. Reductions in suitable rangeland are also resulting in disease outbreaks in animals due to increased mixing of different herds.

The reduction in livestock production and increased water scarcity, as well as uncertain crop harvests, are having impacts on the community's health. Reduced availability of animal milk, utilization of unsafe water

sources and seasonal shifts in climate-sensitive diseases such as malaria are among the many challenges they are facing (Samuel, L. et al., 2021).

Climate change could increase the relative importance of pastoralism versus sedentary crop and livestock farming in arid and semi-arid areas of Ethiopia since traditional cattle varieties grazed in Ethiopia may be better adapted to water and high temperature stresses than the imported varieties used in sedentary livestock production (Rettberg, S. et al., 2017). Improved production practices, such as restoration of degraded rangeland, rotation grazing and fodder cultivation, can reduce or mitigate the negative impacts of grazing livestock on rangelands (Ng'ang'a, S. et al., 2020) and can reduce the GHG emissions per unit of animal products by increasing yields per animal (Kashangaki, J. and Ericksen, P., 2018). Improved practices can also accelerate the production cycle and reduce livestock mortality and morbidity rates (Vétérinaires sans Frontières, 2018). However, if ruminant populations increase, total GHG emissions may increase even if the emissions per animal fall.

Improved livestock production practices can thus have positive and negative impacts on GHG emissions. The positive impacts (i.e., reduced emissions) occur because improvements in rangeland quality allow more carbon sequestration and storage in the soil, while the potential negative effects stem from increases in the ruminant livestock population, which increases enteric emissions of methane. Increases in livestock product yields per animal could reduce methane emissions by allowing farmers to reduce their herd size, particularly where intensive production methods make raising livestock expensive (Ng'ang'a, S. et al., 2020).

The impacts of climate change mentioned above affect men and women differently. There is a general understanding that since climate change has gender-differentiated impact, policies, programs, and interventions need to address these impacts in both mitigation and adaptation responses in order to make interventions sufficient, just, sustainable and avoid further increases in the existing gender gap (MoF, 2019).

A study by Tesfamicahel, W. (2016) shows that although all rural Ethiopian households are vulnerable to climate change, the magnitude of the effect differs, and female-headed households are more vulnerable. In the study, on average, household income in female-headed households declined by 12.4% due to climate variability, while income declined by 5.7% in male-headed households. Given that the study exposed both types of households to the same level of climate shock, the effect was attributed to differences in endowments and adaptive capacity. It is expected, therefore, that female-headed households will become absolutely and relatively poorer as a result of climate variability.

Women and female-headed households are the most vulnerable, least prepared, and likely to be worst affected by climate change. Their limited access to, and control over, resources and information, and their limited input in decision-making processes, increases the vulnerability of many women to climate change (Aklilu, A. et al., 2013; Alebachew, A., 2011; Tesfamichael, W., 2016).

Securing food, water, and energy for the household, as well as maintaining overall household well-being, is the role of women in rural Ethiopia. As a result, extreme climate events such as droughts, floods and rising temperatures place greater pressures on women. Furthermore, during emergencies men are usually forced to migrate while women are left behind with children, assuming additional responsibilities without necessarily having the right skills and knowledge (MoANR, 2017). A study by Alebachew, A. (2011) shows that some men who leave their villages and wives behind sometimes do not continue to support their family and never return, as they establish new lives at their destinations. Migration can thus increase the level of malnutrition due to increased scarcity of food, leading to deteriorating health status of the communities left behind.

Women often engage in growing backyard gardens or purchasing, processing, and managing food and other natural resources, and are often also responsible for raising small ruminants; men are generally responsible for larger livestock and farming crops. In these contexts, responsibility for adaptation to climatic and broader environmental changes mainly falls on women's shoulders, including finding alternative ways to feed their household members (AU, 2012). This is more pronounced for female-headed households, where landholding sizes are smaller and there is limited means of using land due to labor shortages. A case study in different parts of the country reveals that the extent of involvement of female-headed households in weeding of major crops is 84%, while this proportion is 43% for women/wives in male-headed households (Leulsegged, K. et al., 2015).

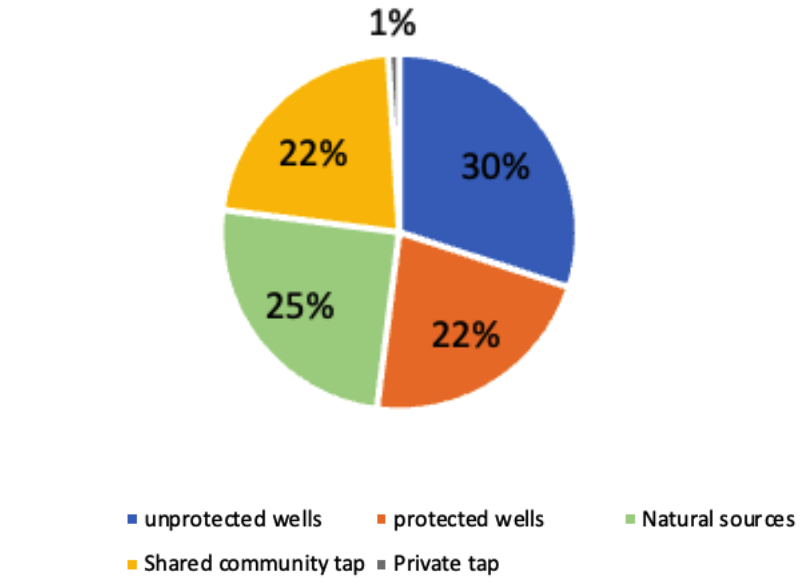
Adaptation preferences in male-headed households tend to focus on on-farm adaptation measures, such as cropping time adjustment, crop diversification, planting cash crops (such as khat and buckthorn) and soil conservation, while off-farm and non-farm diversification adaptation measures are preferred by female-headed households (Azeb, A. and Van Laerhoven, F., 2016). Male-headed household heads are more mobile and have fewer domestic responsibilities and can, therefore, rely on income from temporary labor migration during bad harvest times – which is usually not an option for female-headed household heads, as they are responsible for caring for the children, the elderly and the sick, as well as the cattle (Azeb, A. and Van Laerhoven, F., 2016, Aklilu, A. et al., 2013).

Increased water stress, increasing frequency and intensity of floods and deteriorating water quality are additional critical impacts of climate change. Women usually use water for domestic purposes while men usually use it for agriculture-related functions: women and men therefore often have different needs and priorities in terms of water use (Alebachew, A., 2011).

In drought-prone areas affected by desertification, for example, the time required for water collection increases as women and children (mostly girls) have to travel greater distances to find water (Azeb, A. and Van Laerhoven, F., 2016). As a result, they are forced to spend more hours fetching water, which significantly increases their workload and potentially exposes them to harassment, especially in areas and times of conflict. A study by Alebachew, A. (2011) shows that, on average, women work 14-17 hours each day and, during chronic drought and famine years, the daily work schedule may extend to 16-18 hours and beyond.

According to a time-use survey by CSA (2014), rural households in Ethiopia obtain water mostly from wells or from public/private taps outside their homes. Thirty percent of households obtain water from unprotected wells outside of the household; 22% from a protected well outside of the household; and 25% from natural sources (rivers, springs, etc.). About 22% obtain water from a shared / community tap, and less than 1% of households report having access to piped water on their own premises. Women and girls spend a significant amount of time collecting water. About 56% of rural households have to travel less than 1 hour to get water, while 37% have to travel between 1 and 2.5 hours, and the remaining have to travel even further to fetch water. Poor access to safe drinking water, coupled with illiteracy (73%) and water-borne disease prevalence, greatly influence the participation of girls and female in education, agricultural production, and other development activities (Getachew, D., 2016).

Fig. 4 Water sources in Ethiopia



Source: CSA, 2014

Therefore, easy access to water mostly benefits women and girls, as it reduces the burden of water collection that disproportionately falls on them and makes time available for education and economically productive activities. It also reduces the physical challenges they face (i.e., exposure to physical hardship, sexual and physical violence), when they travel long distances to fetch water (UN Women, 2014). Yet, achieving equity within and among rural communities remains challenging and can compromise the sustainability of groundwater use (Likimyelesh, N. et al., 2018).

An assessment made by a project implemented in Oromia and SNNPR that provided women and men farmers with water lifting technologies found that installing the technologies near households enabled multiple uses in addition to irrigation (Likimyelesh, N. et al., 2017). The assessment showed that both women and men found the technologies ease their work. However, men and women use the technologies for different purposes. While men use water from these technologies mainly for irrigation, women and children use water from these technologies for multiple purposes, including livestock watering and domestic use. For these reasons, a water-based project should give specific attention to gender-based needs and concerns to prevent reinforcing inequities in opportunities for water access and governance or social norms against women (World Bank, 2016b).

Access to resources, including information, affects the likelihood of technologies improving the livelihoods of farmers. Likimyelesh, N., et al. (2017) found that, in their study area, men have greater access to information and women are excluded from decision-making in groundwater development and management due to male dominance, cultural influence and women simply not being invited to meetings, as well as inability to participate due to their high domestic workload. Due to the same reasons, women are reluctant to participate in groundwater monitoring.

Therefore, projects must invest more effort in reaching and informing women, including understanding the times and locations convenient for women. Projects need to extend invitations to women directly for information-sharing events and meetings, and not rely on spouses or men in the community to inform women (Likimyelesh, N. et al., 2017). Even though it is now standard practice for development programs to be built upon 'gender mainstreaming' approaches, the result is often nothing more than a satisfied quota (e.g., a certain number of women in groups or on water management committees), rather than actual participation or influence in decision-making (Lefore, N. et al., 2017). Therefore, it is imperative that steps are taken to address the root causes of women's lack of participation, such as high demands on their time due to domestic responsibilities, and social norms that discriminate against them (Likimyelesh, N. et al., 2018). Unless interventions aimed at empowering rural women and strengthening their limited adaptive capacity and diversifying their narrow livelihoods and income sources are put in place, climatic variability and extreme events will damage food security and the well-being of smallholder farmers and pastoralists, with women bearing the brunt of the impact due to the responsibilities they hold in relation to food security and the well-being of households (AU, 2012).

The development of the Climate Resilient Green Economy (CRGE) Strategy in 2011 has provided a strong basis for climate-resilient development planning across sectors and levels of government in Ethiopia (FDRE, 2011; MoF, 2021a). In 2012, the Ethiopian government established the CRGE Facility as a financial mechanism to support the implementation of priorities identified by the CRGE Strategy (MoF, 2021a). Although studies indicate that the CRGE Strategy, as well as the Climate Resilient Strategies for Agriculture and Forest, and Transport, fail to explicitly address the gender dimension of climate change (Azeb, A and Van Laerhoven, F., 2019; MoF, 2019), recent efforts by the CRGE Facility have tried to ensure gender is taken into account in the implementation of programs and projects managed through the Facility (MoF, 2021b).

III. Gender and climate: institutional, legal and policy frameworks

Legal and policy frameworks

The Government of Ethiopia has demonstrated strong policy commitments to bringing about gender equality and women's empowerment, including in the socio-economic and political arenas. It has signed and domesticated several international and regional policies, development frameworks and conventions, including the Convention on the Elimination of all forms of Discrimination against Women (CEDAW), the Beijing Platform for Action, Agenda 2063, the 2030 Sustainable Development Goals (SDGs), the Maputo Protocol, the Maputo Plan of Action, and the Malabo Declaration.

Further, the Ethiopian Constitution guarantees equality before the law: equal rights to land, property, employment, maternity leave and pay, and equal rights between the male and female counterparts in marriage. Provision is also made for affirmative actions to address the historical legacy of discrimination.

The 1993 National Ethiopian Women's Policy and the 2006 National Action Plan for Gender Equality, accompanied by the National Women's Development and Change Strategy and Package, have served to mainstream women's issues in the country's social, economic, and political affairs.

Furthermore, the Ten-Year Development Plan (2021-2030), which is the country's overarching development strategy, includes women's rights, representation, and access to resources as one of the key areas of focus under social sector development (NPC, 2021). Gender-responsive budgeting (GRB) is expected to be implemented across all sectoral ministries, guided by the National Gender-Responsive Budgeting Guideline developed by the Ministry of Finance.

The Women's Affairs Office was upgraded to a Ministry in 2005 and was restructured as the Ministry of Women and Social Affairs in 2021. Proclamation no 691/2010 expanded the Ministry's mandate to render comprehensive protection and promotion of women's rights and to coordinate the efforts of the Women's Affairs Directorates (WADs) established in the sectoral ministries (MoF, 2019).

In a similar manner, several legislative and policy frameworks have been established to provide directions on how climate change effects can be eradicated or at least reduced. The frameworks range from stand-alone climate change mitigation and adaptation processes to the mainstreaming of climate change into decision-making processes at a national level. Relevant policy instruments are presented below.

National Policy on Ethiopian Women, 1993
The policy outlines the major economic, social, and political concerns of Ethiopian women and indicates broad strategies and interventions (Transitional Government of Ethiopia, 1993). Since then, major programs have been designed to be gender-sensitive or to have gender components, and women's affairs have been given attention with the establishment of an office that eventually grew to the status of a ministry (Amdissa, T., 2018).

The Revised Family Code, 2000
The earlier Family Code granted permission to married women to control assets or pursue a profession, but it failed to offer protection to unmarried or widowed women. The 2000 Revised Family Code better protects women by granting equal rights to spouses during the duration, conclusion, and dissolution of marriage, requiring equal asset division between the husband and wife upon divorce (FDRE, 2000).

In an attempt to improve women's ability to earn, work and thrive outside of the home, the 2000 Revised Family Code changed the legal age of marriage to 18. A study in 2013 showed that, by 2005, five regions and two charter cities had implemented this change. The increased marriage age helped improve participation in the labor market, particularly for young women. In the five regions, labor force participation rose by 15-24% more than regions that had not yet implemented the change (Hallward-Driemeier, M. and Gajigo, O., 2013).

Water Resources Management Proclamation, 2000
The Ethiopian Water Resources Management Proclamation (WRMP) is the main living policy governing the water resources sector. The theme of the WRMP revolves around the sustainability and equitability of water uses; and crossing-cutting issues in general. The WRMP indicates that management of water supply and sanitation services is to be at the lowest and most efficient level of institutional set-up, which provides for the full participation of the users for effective decision-making (FDRE, 2000). The main constraint surrounding the water resource is its uneven spatial and temporal occurrence and distribution among the major river basins. 80-90% of the water resource is found in four river basins; namely, Abbay (Blue Nile), Tekeze, Baro-Akobo and Omo-Gibe in the north-western and south-western parts of Ethiopia, where just 30-40% of the national population is found (Israel K, and Merkineh M, 2020).

The Ethiopian Water Resources Management Policy and Water Sector Strategy, 2001
The Policy (MoWR 2001a) has a section on gender issues which aims to "promote the full involvement of women in planning, implementation, decision making and training, as well as empower them to play a leading role in self-reliance initiatives." The Strategy (MoWR 2001b) emphasizes gender mainstreaming with the aim to:

- Pay special attention to the role of women while establishing community-based structures for the management of localized water supply and sanitation (WSS) and small-scale irrigation systems. Allocate a specific number of seats for women in these community-based structures, depending upon the nature and size of the scheme.
- Enhance the active involvement of women for the success of water projects and programs, and for the sustainable services of water schemes. Launch campaigns to encourage women to contribute to improved management of water schemes.
- Take steps to relieve women from the huge burden of fetching and carrying water for the family by empowering them in decision-making in water projects.

Land Registration Act, (FDRE, 2003)
The Act sought to grant equal inheritance and property rights to women. It facilitated land registration of households, accompanied by a low cost of issuing certificates. To ensure transparency, land certificates were issued after public registration. Furthermore, the Ethiopian land certification scheme required that land administration committees at the *kebele* level, the smallest administrative unit in Ethiopia, include at least one female member (Holden et al., 2011). The presence of female members in the land administration committees encouraged female-headed households to participate in land certification. Overall, Ethiopia's land registration process increased tenure security for women (World Bank, 2019a). A study across 15 villages in Ethiopia found that, combined with the Family Code revisions, the 2003 Land Registration Act shifted perceptions and social norms related to the division of assets upon divorce (World Bank, 2019a).

Climate Resilient Green Economy (CRGE) Strategy, 2011
The CRGE Strategy integrates climate change adaptation and mitigation, and resilience-building measures, into the country's development planning objectives. It has recognized agriculture, health, water and energy, buildings, and transportation as the most vulnerable sectors to climate change (FDRE, 2011). More than 150 potential green growth opportunities were identified, of which 60 were prioritized for inclusion.

Studies show that the CRGE Strategy is weak in terms of identifying gender equality issues and in elaborating the challenges to women relevant to the different identified priority sectors. The only initiative that mentions the potential positive impact on women is the Rural Energy and Efficient Stoves Initiative, where the potential to contribute to gender equality is indicated without any specific detail (MoF, 2019).

Despite the Strategy recognizing the effects of climate change on people's livelihoods and social well-being in its vision statement, it is silent on the differential impact of climate change on men and women. The Strategy provides no explanation for how the gendered nature of climate change problems and their solutions can be addressed (Azeb, A and Van Laerhoven, F., 2019).

Following the creation of the CRGE Facility in 2012 and the development of sector climate-resilient strategies in 2015, the Facility has recognized the need to have deeper gender integration across different

priority sectors, the institutional architecture and program implementation, and has taken some steps towards this in recent years (MoF, 2021a).

Climate-Resilient Strategy for Agriculture and Forestry, (FDRE, 2015a)
The Climate-Resilient Strategy for Agriculture and Forestry sets out to ensure climate-resilient economic growth in Ethiopia. It focuses on three sub-sectors identified as being the most vulnerable to the impacts of climate: crops, livestock, and forestry.

As indicated in previous sections, agriculture is a sector where the role of women is very significant and there is, therefore, a need to identify potentials for equitable participation and benefit from investments geared towards mitigation and adaptation. However, a review undertaken in 2017 shows that the Strategy rarely mentions the terms gender, women, or females, and where it mentions any of these terms hardly any explanation is provided on what the gender- and climate-related challenges, impacts and pursuant actions should be. In the instances where the terms are used, it portrays women as being impacted by climate change but without articulating specific mechanisms to address their vulnerability (Azeb, A. and Van Laerhoven, F., 2019).

Further, the Strategy identifies 41 adaptation options, which are further categorized under nine themes. One of these themes is social protection for high-priority groups, including women and children. However, the remaining themes (capacity building and institutional coordination, information and awareness, crop and water management on farms, livestock, value chains and market development, sustainable agriculture and land management, natural resources conservation and management, disaster risk reduction) include no references to gender and women's issue.

Climate-Resilient Strategy for Water and Energy, (FDRE, 2015b)
The Climate Resilient Strategy for Water and Energy aims at economic growth and poverty reduction by analyzing the economic and social impacts of current climate variability. It takes preventive measures for the impacts of future climate change in the water and energy sectors to build climate resilience in Ethiopia.

A review of the Strategy indicates that the Strategy includes few references to the impact of climate change on women. For instance, even though there is an overall statement that identifies the positive contribution of improved access to water on women's lives, no detailed information is provided to understand what will be done and how the changes will come about. Further, the vulnerability assessment does not consider gendered power relations, institutions, or other socio-economic drivers. Of the 11 identified strategic priorities, only one (the development of the gender action plan) reflects women's issues (MoF, 2019).

On a positive note, the Strategy does recognize a few gender issues, including the impacts of lack of access to modern energy services on women's workloads, their participation in productive activities such as education and employment, their health and lack of access to clean water and sanitation. Moreover, although it has yet to materialize, the Strategy has committed to developing a gender action plan (MoF, 2019).

Climate-Resilient Strategy for Transport, (FDRE, 2015c)

The Climate-Resilient Strategy for Transport sets the framework to deliver an integrated, modern transport system with a focus on multi-modal transportation and good customer service. A review by MoF (2019) indicates that this Strategy is completely gender-blind with regard to its contents.

Gender Equality Strategy for the Agriculture Sector (MoANR, 2017)
The Strategy recognizes the limitations of female farmers and proposes to address these through capacity building of staff on gender-sensitive planning, programming, and service delivery. It also emphasizes the need to support the revision and implementation of land-related policies and to strengthen institutional structures and systems in Ethiopia to increase the profitability and productivity of women in the agriculture sector. Meaningful participation of women in decision-making and partnership with other relevant ministries to promote gender equality are also among its strategic objectives.

Women's Development and Change Package and Strategy (MoWCA, 2017a,b)
The Women's Development and Change Package recognizes that female farmers have limited access to extension services and highlights services that should benefit women, including input use, labor-saving technologies, participation in horticulture, nutrition-dense crop production, irrigation soil management and agro-processing.

The Women's Development and Change Strategy lists a set of interventions related to ownership, access, and use of land. Among these are: encouraging sharecropping where women lack the required labor to cultivate their land, ensuring women obtain fair sharecropping agreements, assigning plots to landless women, and making women aware of their land ownership rights.

Ethiopia's National Adaptation Plan (NAP-ETH), 2019
NAP-ETH is a key element of the country's response to climate change, under the framework of the CRGE Strategy. Ethiopia's NAP was developed in 2017-2018 with the goal of reducing vulnerability to climate change by building adaptive capacity and resilience (FDRE, 2019). A detailed gender analysis to inform the implementation of the Plan with a better understanding of gender issues – as they relate to vulnerability and adaptation to climate change – was commissioned in 2019. The analysis identified three main issues that need to be considered in the implementation of the NAP-ETH: (i) gender differences in adaptation needs, opportunities, and capacities; (ii) equitable participation and influence in adaptation decision-making processes; and (iii) equitable access to financial resources and other benefits resulting from adaptation investments. The document further elaborates on actions to be taken to address these issues, with the aim of providing a roadmap to integrate gender considerations into the implementation of the NAP-ETH (FDRE, 2019). The NAP implementation roadmap was developed in 2020 and identifies 5 implementation strategies which focus on agriculture and water; natural resources management; health, livelihoods, and social protection; climate services and adaptation technologies; and infrastructure. Each strategy identifies adaptation options with corresponding key activities and gender considerations (FDRE, 2020).

Gender Mainstreaming Strategy 2020-2023, CRGE Facility
The CRGE Facility has developed a Gender Mainstreaming Strategy to address gender gaps and opportunities relating to its climate finance mandate. The overall goal of the Strategy is to enable vulnerable women and men, young girls, and boys to improve their livelihoods, to raise their incomes and strengthen their resilience to climate change. The Strategy aims to achieve this by creating equitable and fair opportunities for men and women to support a paradigm shift to low-emission and climate-resilient development. The Strategy has four strategic outcomes, with associated outputs and activities, as well as a gender implementation plan to ensure its implementation and monitoring and evaluation. The strategic outcomes identified are:

1. Strengthened policies, institutions, and processes within the CRGE Facility and Executing Entities on the promotion of gender equality.
2. Enhanced gender mainstreaming capacities and strategy delivery within the CRGE Facility and Executing Entities.
3. Increased design of gender-responsive projects and programs in the CRGE Facility.
4. Increased participation of women in climate action decision-making.

The Strategy builds upon the findings and recommendations of the Gender Framework developed for the Facility in 2019, a scoping study conducted in 2019, the National Women's Policy and the Green Climate Fund (GCF) Gender Policy and Action Plan. It is an important first step, one that will enhance institutional capacity to address gender concerns in the climate change space. It is expected to strengthen key interventions that tackle structural changes that accelerate gender equality and inclusion in the core operations of the CRGE Facility and its implementing and executing partners at various levels (MoF, 2020).

Updated Nationally Determined Contribution (NDC), 2021
The updated NDC builds on the initial NDC submitted in 2015. The updated NDC includes updated greenhouse gas emission projections and is aligned with the national Ten-Year Development Plan. In the updated NDC, Ethiopia commits to increased mitigation: to reduce economy-wide emissions by at least

68.8% by 2030 against the business-as-usual projection. The NDC also specifies 40 adaptation interventions (FDRE, 2021).

A gender analysis undertaken on the updated NDC shows that there are neither gender-specific intervention areas nor gender-disaggregated results and indicators to ensure gender mainstreaming in the mitigation interventions. Although there is improvement in the updated adaptation actions, the analysis indicates that, of 66 performance indicators tracking the performance of adaptation interventions, only 4 are gender disaggregated. The analysis acknowledges that areas identified for GHG emission reductions, particularly in agriculture, forest, and natural resources, have immense potential for gender inclusion; however, very few gender-specific interventions are included.

The analysis concludes that there is a lot to be done during the preparation of detailed implementation plans at the sector levels. It also proposes that gender equity funding in the sectors should focus on specific objectives rather than general mainstreaming activities, which usually do not result in tangible outcomes. Financing being a key driver of effective implementation of gender-responsive adaptation and mitigation interventions, the analysis calls for an earmarked budget to implement gender-responsive activities (Bedaso, T., 2021) .

The Ten-Year Development Plan (2020/21 – 2030/31)

Ethiopia's 10-year Development Plan sets the government development mission from 2020/21-2030/2031. In the social development plan section, the document affirms that due attention will be given to women's rights, representation and equitable access and ownership to resources. This includes completely addressing the 44% gender gap in wages, giving land ownership right for 59.7% of women among those who do not currently have ownership rights and increasing the proportion of women who have access to loans from the current 33% to 55%. The Plan also has a section on realizing a climate-resilient green economy though development and conservation of the environment, forest, wildlife, and biodiversity (Plan and Development Commission, 2021).

Institutional Arrangements

The 2001 water sector strategy puts provision for the promotion of establishment of water users' association and irrigation cooperatives at local levels, while promoting the role of women in these community-based structures. These structures are meant to make independent informed choices in the water supply and sanitation management.

The establishment of the Ministry of Women's Affairs in 2005, with structures at regional, woreda and sector department levels, indicates the government's commitment to gender equality. The Ministry is charged with the responsibility of overseeing and coordinating the work of sectoral ministries in their efforts to address gender issues (JICA, 2006). Since its inception, it has facilitated the development of various policies, including the Women's Development and Change Package, that identify gender issues relevant to climate change response interventions. The Ministry has been given different names over the years and, in 2021, it was restructured as the Ministry of Women and Social Affairs.

A number of reports on the integration of gender and climate change shows that there has been limited success in collaboration of the different sectors. In 2012, it was found that the Women's Affairs Departments within sectors were not actively contributing towards integration of gender in the context of the CRGE Framework, mainly due to their limited human and financial capacity, inadequacy of resourcing and their limited integration into decision-making and planning processes (AU, 2012).

A more recent study (2017) showed that the involvement of the Women's Affairs Departments in policy/program development was weak, and their participation was reported as "just a formality" (Azeb, A. and Van Laerhoven, F., 2019). Within the Ministry of Agriculture, where a gender mainstreaming manual was developed, at the zone and wereda levels (where actual implementation takes place) the assigned gender focal persons were found to have no or very limited knowledge of gender issues (Azeb, A. and Van Laerhoven, F., 2019).

A scoping study conducted in 2020 on the Climate and Gender Directorates of the Ministry of Finance and the Environment, Forest and Climate Change Commission concluded that there is consensus amongst stakeholders that gender-responsive climate change policy and program are vital for addressing climate change issues. However, the understanding of which gender issues need to be incorporated into the day-to-day operations of these departments, and how, varies across and within the consulted offices and officials, indicating the need to create a common understanding. Moreover, despite the interest in integrating gender within the climate change sector, a lack of institutionalization has severely deterred gender-responsive planning and implementation of program, accountability and monitoring, intra- and inter-sectoral coordination, and gender-equal decision-making on climate change issues (Mulugeta, M. and Lealem, M., 2020).

In December 2020, the CRGE Facility and the then Ministry of Women, Children and Youth (MoWCY) launched the National Community of Practice for Gender Equality and Social Inclusion in Climate Change. It was agreed that the Women's Affairs Directorates of the Ministry of Finance and the Environment, Forest and Climate Change Commission would serve as the co-chairs of the community of practice (COP), while MoWCY would provide overall guidance. Members include sector ministries, non-governmental organizations, development partners and academia. In 2021, the first meeting of the COP was held, in which relevant sectoral experts worked on and approved the terms of reference and the 2021/2022 workplan. The specific objectives of the COP are to inform strategic decision-making; plan harmonized and aligned investment programming, capacity development and implementation; advocacy and resource mobilization; and monitoring, evaluation, reporting and knowledge management (MoF, 2021b).

IV. Key Gender and Climate Change Issues at Project Sites

The project aims to sustainably extract groundwater from deep aquifers for agricultural production and drinking and increase the local communities' adaptive capacity. The two climate-vulnerable project sites identified are:

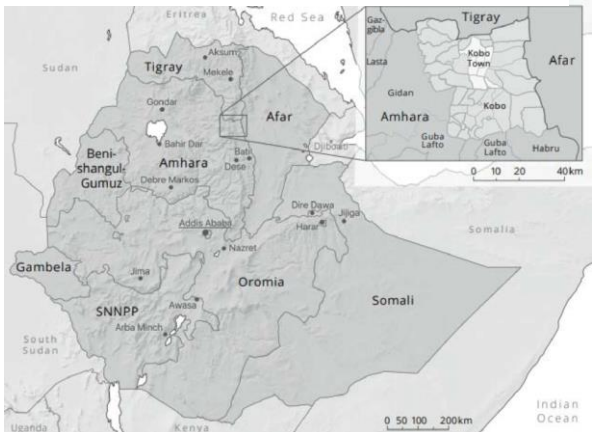
- The Amhara region's Raya-Kobo Girana Valley (for agricultural production); and
- The southern rangelands in Oromia region's Borana zone (for agricultural production and drinking water).

Raya-Kobo Girana Valley, Amhara Region

Background

The Amhara region is situated in the northwestern and north central part of Ethiopia. It is one of the four largest regions, with a population of 21.1 million. 84% of the population live in rural areas and are engaged in agriculture (UNICEF, 2018). Crops that are grown in the region include teff, barely, wheat, oil seeds, sorghum, maize, oats, beans, and peas (UNICEF, 2019a). Large number of livestock, 8,314,200 (27.9% of the national total), are found in the region (USAID, 2000). The region has various water resources, including Lake Tana, and several rivers that provide great potential for irrigation development (UNICEF, 2019a).

Fig 5: Location map of Amhara region and Kobo-Girana Valley



Source: Gebreves. M. and Müller-Mahn. D., 2019.

Although there has been consistent decline in monetary poverty, largely due to agricultural growth and benefits from program such as the Productive Safety Net, there is still a lot to be done to meet the SDG targets for the region. Over one-quarter (26%) of the population live below the national poverty line (the SDG target being 13%) and almost one-third (31%) live below the food poverty line (SDG target 16%).

The median age of 16.2 years for first marriage among women aged 20-49 years is the lowest in the country. The rationale of child marriage in the region relates to the belief that marriage reduces the risk that daughters engage in pre-marital sex, exposing them to sexually transmitted diseases and pregnancy while unmarried, which would lead to family disgrace and social stigmatization (UNICEF, 2019a).

As in most other regions of Ethiopia, Amhara women and girls are traditionally labelled as nurturers and caregivers; thus, childcare responsibilities often fall exclusively on them. 83% of first marriages are decided by parents and 64% of women stop attending school after marriage, with the main reason being that they are too busy with family life (UNICEF, 2019a).

As in other regions, Amhara women are often denied their share of inheritance when their parents or husbands die. It is also common for women to be excluded from decisions on common property in marriage and to be denied their due share during a divorce (UNICEF, 2019a).

Gender-based violence is high in Amhara region, with women aged 15-49 reporting psychological (26%), physical (22%) and sexual (10%) violence. Further, 65% of women and 46% of men believe that a husband is justified in hitting or beating his wife in various circumstances (UNICEF, 2019a).

The climate in Amhara region is affected significantly by weather variations: farmers face droughts, frost, hailstorms, flooding, and landslides. Localized flooding of fields by rainfall run-off is a frequent problem. It was estimated that more than 100,000 people were at risk of flooding and more than 25,000 people were likely displaced in 2018 (UNICEF, 2019a).

According to the 2016 Ethiopia Demographic and Health Survey (EDHS), 64% of households use improved drinking water sources in the region, with only about 17% of water sources being piped. The Ethiopia Socioeconomic Survey (ESS) 2017 shows that 37% of households spend 30 minutes or more reaching the nearest water source, fetching water, and returning to their dwelling. As in other parts of the country, women and girls are mainly responsible for fetching water. The availability and sufficiency of drinking water is 82% and 75%, respectively.

A study on gender mainstreaming in selected sectors in the Amhara region shows that, despite the existence of legal and policy frameworks, in practice gender mainstreaming is not being implemented. It is also not taken into consideration in the region's plans, implementation, monitoring and evaluation and budgeting. Therefore, more work is needed to see changes on the ground (Bishaw, A., 2015).

Raya-Kobo Girana Valley

Kobo-Girana valley is found in North Wello zone of Amhara region and has diverse agro-ecological zones. The valley consists of, on the one hand, dry and moist kola agro-ecological zones, which are characterized by relatively fertile alluvial soils, an erratic rainfall regime that is drought-prone, and frequent drought and crop failures. On the other hand, the highland and mid-altitude zones enjoy relatively abundant rainfall but suffer from heavy population pressure, land degradation and significant levels of poverty (FDRE, 2007).

The valley has a bimodal rainfall pattern. The short rainy season (the Belg season), which extends from March to May, is unreliable and only a small proportion of annual agricultural production is produced during this time. Production in this season accounts for 26% of the area farmed and 35% of rain-fed crop production. The production in this season is mainly in the highlands and mid-altitudes, with very few pocket areas in the lowlands. The main rainy season (the Kiremt season) extends from June to September. Rainfall volume and pattern is more reliable in this season, making it the principal agricultural production season. Production during this time accounts for 74% of the farmed area and 65% of annual rain-fed crop production. However, in recent years rainfall volume and pattern changes have been significant, with substantial impacts on agricultural production and livelihoods (FDRE, 2007).

The months extending from October to February are the dry season, characterized by no or little rainfall, high daily temperatures, and critical shortage of water, particularly in the lowland areas (FDRE, 2007).

In a survey undertaken in 2007, the average household size is about 4.9. Female-headed households tend to be smaller - the average family size of female-headed households is almost 80% of that of male-headed

households. The net annual population growth rate is estimated to be 3.5%, which means the population of the kebeles will most probably double in 20 years. The mean age at first marriage for females in the area is about 17 years while that of males is 24 years. In general, 58% of the total ever-married population is married at an age of less than 20 years (FDRE, 2007).

High population density has resulted in serious environmental degradation, as well as increasing number of land deficit households. In 2007, the number of people subsisting on a hectare of land was about 4.2. Traditional agriculture – crop and animal rearing – dependent on rainfall is the dominant livelihood strategy of the majority of the population in the area, making them vulnerable to climate shocks. Small-scale traditional and modern irrigation systems are practiced by more than 18,500 households. As a result of environmental degradation, changing patterns of rainfall, low level of input use and poor cultural practices, annual crop yields are very low. Irrigated crop production accounts for about 38% of annual cultivated land and 40% of total annual production. Most of the irrigation systems practiced by the majority of the households are traditional river diversions (70%) and, for a few households (30%), modern small-scale irrigation constructed by the government and various non-government organizations active in the area in the last 20 years. Irrigated crop production is only practiced once per year, mainly during the dry season extending from October to the end of March in most areas, with supplementary irrigation slowly starting in a few households (FDRE, 2007).

The problem of water management is critical in areas that are dependent on traditional river diversions. For those using modern small-scale irrigation, the major problems are lack of adequate technical expertise to manage pumps, water and supplementary logistics and materials, as well as lack of frequent maintenance of dilapidated hoses. In addition, oxen-dependent cropping systems, shortage of labor, lack of adequate and frequent capacity building and training for the farmers, and weak water users' associations and cooperatives are not only impediments to the productivity of irrigation systems but also serve as major constraints on the marketing and distribution of production in the project area (FDRE, 2007).

The main crops produced are cereals, pulses, oil seeds, vegetables, and fruit crops. Crop production is low-yielding and highly vulnerable to various natural and man-made risks. As a result, crop production is mainly subsistence-based, with no or small marketable surplus. However, irrigated crops are mostly sold in the market. Vegetables and fruits are produced in both seasons, using both rain and small-scale irrigation. Of the total area under horticultural crops (including sugarcane), 48% is under traditional and modern small-scale irrigation and the remaining 52% is produced under the rain-fed system. Vegetable production is rapidly increasing due to the expansion of drip irrigation and market opportunities (FDRE, 2007).

Farm practices such as intercropping, crop rotation and fallowing are not common. The shortage of land generally limits such fertility-improving practices. In the highlands, the average land holding per capita (cropped land) is less than 0.15 ha. In the mid-altitudes and lowland areas, crop rotation is practiced, although the proportion of land under rotation each year is very low – due, again, to the shortage of land, as well as the limited production of pulses (FDRE, 2007).

Although access to irrigation land is determined mainly by proximity of land holdings to irrigation water and facilities, significant disparities are evident in access to irrigation, training, and extension services. The majority of female heads do not use irrigation at all due to cumulative effects of inequalities such as lower access to productive assets that leads to less income, low decision making power and low access to basic services including literacy programs, education and health. Of the households that have ever used irrigation, only about 22% are female-headed (25% of the total female-headed households). Of these, only 41% have developed adequate experience to use irrigation, compared with two-thirds of male-headed households. The proportion of female heads who have received training in irrigation is half that of males. Of those females who have received training on irrigated agriculture, only 8% report that the training was adequate. In contrast, 92% of male heads report the training is adequate. In addition, only 20% of female heads have access to irrigation extension and support services, compared with 80% of male heads. Furthermore, the average holding of irrigated land is only less than 0.4 ha for female heads compared to 0.7 ha for males (FDRE, 2007).

Most women in the valley are engaged in family and household chores in addition to supporting agricultural activities such as weeding, harvesting, and transporting. In some parts of the highlands, women are also engaged in planting, ploughing, and threshing. Decisions on planting time, the sale of animals and crops and other matters that affect the household are predominantly made by males. However, this applies to married women; most divorced, separated, and widowed women are the decision-makers in their households. Equal decision-making is, however, common with regard to some issues, particularly migration of family members, marriage and schooling, and land acquisition and contracting and, sometimes, marketing of large animals such as oxen and cows (FDRE, 2007).

Although men and women have equal legal rights to their own productive assets, in reality women are at a disadvantage. Women usually have less land and fewer animals and tools and, as a result, produce less and earn less.

Although women and men have equal legal rights to inherit and possess land, the majority of female-headed households actually own smaller plots of land compared to male-headed households. Women in general own land when they are separated from their husbands either due to death, divorce, or permanent separation: very few of them own land through inheritance. The proportion of male-headed households with less than half hectare of land is, for example, 16%, whereas that of female-headed households is approximately 33%. In the category of more than two hectares, the proportion of male heads is more than 2.5 times than that of females. In addition to the relatively small plots of land they cultivate, women-headed households usually lack farm oxen, labor, and inputs. Furthermore, only about one-quarter of female heads own fertile land, while for males the proportion is about 37% (FDRE, 2007).

The effect of the shortage of farm oxen is more critical for the livelihoods of the female heads than those of males. Most of the female-headed households use sharecropping and contracting the land to cope with shortages of farm oxen and tools. These households usually suffer from low productivity, low cash incomes and food shortages. Only 25% of the female heads have two or more farm oxen (50% of males do so). The proportion of females with no oxen is also twice that of males (FDRE, 2007).

Female-headed households produce less than male-headed households. The average annual production of female-headed households is only 1,211 kg, compared to 2,080 kg for males. Female-headed households depend more on purchases from markets to fill their food gap. About one-third (30%) of their food needs is obtained through purchase from the market (cash saved, sale of animals, daily labor, etc.). For males, market purchases account for 24% of annual food consumption (FDRE, 2007).

The average cash income of female-headed households is only 1,656 ETB, 56% that of males. Over 91% of the income of the female-headed households is obtained from crop sales. Non-agricultural income accounts for less than 5% of their total cash income. Of their annual cash expenditure, about 94% is for immediate consumption purposes. Investment expenditure accounts for only 6%. For male-headed households, however, consumption and investment expenditure account for 87% and 13%, respectively (FDRE, 2007).

Although rural credit schemes are said to provide loans to the most vulnerable, only 23% of female-headed households report having access to rural credit in recent years. The proportion of male-headed households is 29%. Moreover, the average loan size for female-headed households is 71% that of male-headed households (FDRE, 2007).

The water supply coverage of urban and rural areas in the region is about 97% and 41%, respectively. The sources of potable water in the project area includes developed springs, and deep, shallow, and hand-dug wells. However, due to the inadequacy of these sources, a considerable number of residents also use river water and unprotected sources. Most protected water sources are found to be potable except protected springs, which are sometimes found not to be good due to high levels of salinity. Access to safe water has improved, but there is still a considerable demand gap and is one of the priority needs of the communities in the area. The majority of the protected and unprotected water sources (except tap water) are not adequate throughout the year. The lack of access to clean and adequate water is the cause of water-borne diseases in the area, which are the cause for over 50% of morbidity, especially for children under the age of five (FDRE, 2007).

The frequency of fetching water depends on the family size of the household. Over half of households fetch water two or more times a day and spend a minimum of two hours per day doing so. The burden of fetching water from different sources is the responsibility of the wife, followed by adult females and then girls. This has an adverse impact on the ability of girls to attend school and hinders women from effectively participating in income-generating activities (FDRE, 2007).

Considering this, the Kobo-Girana Valley Development Program (KGVDP), a government-led large-scale ground water-based irrigation program, has installed three water supply points in lowland villages of Raya-Kobo and Habru woredas.

About two-thirds of household members in the region are illiterate. The main reasons for illiteracy are the need for labor, lack of awareness, poverty, and shortage of access to school (primarily because it is too far away). Slowly, most cultural, and religious barriers and attitudes towards gender and education are changing and girls have almost equal access to education. As a result, about 34% of the female population is now literate. However, in terms of the average grade completed, over 50% of females complete up to grade four; with increasing grade level, the proportion of girls declines from 25% in grades 5-6 to 1.5% in grade 10 and above. The proportion of girls in grade 10 and above is almost 2.5 times less than that of boys (FDRE, 2007).

Though slowly changing, the role of girls and women is still mainly limited to household chores. Poverty, lack of access to water supply at close distances, early marriage, lack of access to technologies (improved stoves, grinding mills, energy sources, etc.) and lack of nearby secondary schools contribute not only to low school enrolment but also to high drop-out rates of girls. Girls from poor families and female-headed households have relatively lower access to education services (FDRE, 2007).

In times of stress, cultural norms affect women. Mothers and adult women usually eat after they feed their husbands and children, and hence cyclical and chronic food shortages and malnutrition affect women more than men. Maternal malnutrition has a synergistic effect on the family and the child. Women are more vulnerable to various diseases, which cause significant maternal mortality and still birth as well as pre-natal and post-natal complications. Only 46% of women visit health services during pregnancy – and, for female heads, it is only 34%. Furthermore, for the majority, delivery is done in their own home, with only 4% delivering at health facilities (FDRE, 2007).

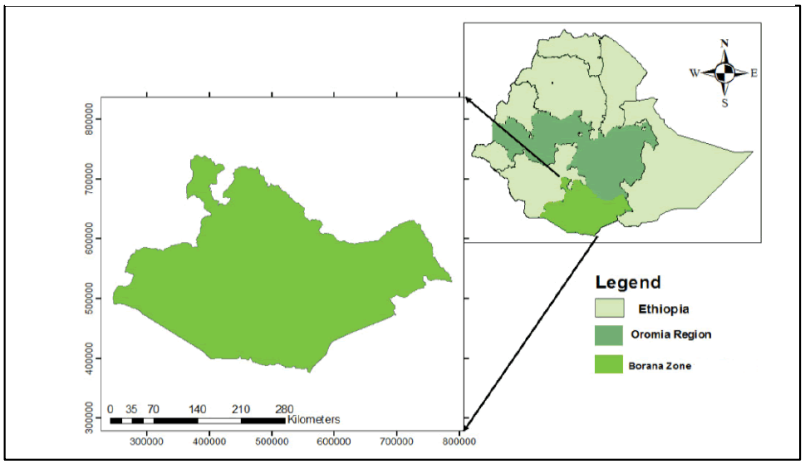
Conflict in the area where the KGVDP office is located has resulted in difficulty to access latest data for this gender assessment. Therefore, the scoping study that will be conducted at the beginning of the project will include a gender baseline assessment in the Raya-Kobo Girana Valley.

Borana Zone, Oromia Region

Background

Oromia is the largest region in Ethiopia, occupying approximately 34% of the land area and accounting for 37% of the population. The total population is over 37 million. Under-18s account for 54% of the population (CSA, 2017b). The fertility rate in Oromia is higher than the national average, with a total fertility rate of 5.4 compared to the national rate of 4.6 (CSA, 2016). The average household is also large, at 5.2 people per household compared to the national average of 4.8 people per household (CSA, 2017c).

Fig 6: Location map of Oromia region and Borana zone



Source: Godana, J. and Sisay D., 2021.

Oromia has a diverse range of agro-ecological zones. Sedentary rain-fed agriculture and livestock production dominates in the highland areas while the lowlands are characterized by pastoralist communities who depend on livestock production (UNICEF, 2019b). The region is divided into 20 administrative zones, with 84% of the population living in rural areas (CSA, 2019). Oromia has experienced high and sustainable economic growth, due primarily to growth in the agricultural sector; however, there are limited off-farm job opportunities in the region, especially for youth (UNICEF, 2019b).

Strong agricultural growth, positive results from the Productive Safety Net Program (PSNP), and implementation of pro-poor economic and social development policies and strategies have all contributed to an increased per capita income in the region (World Bank, 2015). The region succeeded in achieving a 16% decline in monetary poverty between 2004/05 and 2015/16 (FDRE, 2017). A poverty analysis study in 2015/16 found that the poverty headcount ratio in Oromia was 23.9%, just above the national average of 23.5 percent (FDRE, 2017).

Oromia region has the most repeated beneficiaries of relief food in Ethiopia, especially between 2016 and 2018 due to extreme droughts (UNOCHA, 2019). In 2022, the region had 792,686 internally displaced persons due to conflicts and climatic shocks (IOM, 2022).

The proportion of pregnant women who gave birth in the five years and who received antenatal care from a skilled health provider during their pregnancy is 71%, the fourth lowest rate in Ethiopia. Only 44% of births are assisted by a skilled attendant (doctor or midwife) and 56% of women give birth without any assistance during delivery.

There is high prevalence of malnutrition, with serious implications for social and economic development. In Oromia, 28% of child deaths are associated with under-nutrition (CSA, 2016), with 36% of children under 5 stunted, 5% wasted and 16% underweight (EPHI, 2019). Stunting is associated with low socio-economic status and mothers' educational attainment: the children of mothers with no education are more than two times more likely to be stunted than those whose mothers have completed secondary or higher education (EPHI, 2019).

The gross enrolment ratio (GER) and the net enrolment ratio (NER) for pre-primary education in Oromia are low (29.4% and 16.4%, respectively) and far below the national average of 40.7% and 23.9%, respectively. Only 46% of students complete the first cycle of primary education (grade 4) and the dropout rate in primary schools is 20%, higher than the national average of 17.5%. Some of the reasons for high dropout rates and grade repetition include demand for child labor by rural households, child marriage, abduction of girls, long distances to schools, internal migration due to climate change, drought, and conflicts (MoE, 2018).

About 17% of water sources in Oromia are piped and 63% of households use improved drinking water sources, marginally fewer than the national average of 65% (CSA, 2016). 28% of households spend more than 30 minutes bringing water to their houses compared with the national average of 32% - reflecting progress in water infrastructure and the availability of water sources. As elsewhere in the country, women and girls are mostly responsible for fetching water (UNICEF, 2017a).

Lack of water supply and proper facilities, as well as hygiene products in schools, are major challenges for girls, leading to girls missing (and some even dropping out of) school due to menstruation. 90% of schools never have water available and 100% of schools never have soap available. There is a clear need for a gender-inclusive approach to improving water supply, sanitation and hygiene infrastructure in schools, in order to address school absenteeism, performance and completion (UNICEF, 2017b).

Dependency on land and weather for agricultural and livestock production is a key vulnerability for many households in Oromia (World bank, 2015). Climatic shocks contribute to increased internal conflicts because of trans-boundary competition over resources, such as grazing land, arable land, and water (UNICEF, 2014).

There was an increase in the average median age of marriage in Oromia between 2000 and 2011; however, progress has since stagnated and currently stands at 17.4 years. There has also been a decline in child

marriage rates, from 58% in 1991 to 48% in 2016 – but still well above the national average of 40% (CSA, 2016).

In coming decades, rising temperatures, extraordinary rainfall events and more intense and prolonged droughts and floods are projected (World Bank, 2010). The high prevalence of poverty, high rates of malnutrition, high population growth and low climate adaptive capacities increase vulnerability to climate change (World Bank, 2010). Women and girls experience greater risks, burdens, and impacts of climate change, as emergencies exacerbate existing gender inequalities (CEDAW, 2018). During climate change-induced emergencies, formal and informal protection mechanisms break down and human rights abuses increase, resulting in increased gender-based violence that affects women and girls disproportionately (UNICEF, 2019b).

As in most other regions of Ethiopia, Oromia Regional State has a patriarchal society in which men hold primary power in private and public life. Women and girls have traditionally performed their roles in the domestic sphere, and these activities are often considered inferior. Women and girls are labelled nurturers and carers, with the result that childcare responsibilities often fall exclusively on them (UNICEF, 2019b).

In line with the national average, in Oromia 35% of women (aged 15-49) decide for themselves to marry, while parents make the decision for 61% (CSA, 2016).

Borana zone

Borana zone is located in the southern part of Oromia Region. The population of the project area is estimated at about 347,000, of whom 50.3% are male and 49.7% are female. There is a total of approximately 43,000 households, of which approximately 30,00 are male-headed and 13,000 are female-headed. Of the total population, only 11% live in urban areas, while 89% reside in rural areas. The average family size is about 5.6 (OWMEB, 2018).

The climate of the area is characterized as arid and semi-arid. The average annual temperature ranges from 14.5 to 31.7°C. Average annual rainfall ranges from 450-550 mm. There are two short rain seasons in a year for crop production and the growth of pasture for livestock: Ganna, March to May; and Birraa, September to October (OWMEB, 2018).

The topography is characterized by an expanse of flat lowlands and hills at certain intervals, with variation of ground elevations, which range from 1,100 up to 2,495 meters above sea-level (masl). Broadly, the area is divided into three main physiographic regions; namely, the eastern mountainous ridge and associated valleys, the central valley plain, and the western plateau (OWMEB, 2018).

The land-use patterns of Borana Zone consist of grazing land, built-up areas, protected forest land, shrub and bushland, marshy areas, cultivable land, waterbodies, and lava. Traditionally, land is communally held, used, and administered by clan chiefs in Borana society. All members of the society have equal access and rights to land and water in Borana Zone, with no gender, age, or social discrimination. However, there is now a gradual tendency towards individual land holdings and private pastureland, partly because of scarcity of resources and partly because of the desire to accumulate wealth (OWMEB, 2018).

The livelihood of the Borana people is based on agro-pastoral activities, which includes mostly animal husbandry and small crop production. Other supplementary off-farm activities, such as petty trades, sales of charcoal and firewood, and daily labor in towns, are also undertaken by some households (OWMEB, 2018).

Crop production is often constrained by poor soil fertility, unreliable rainfall, and termite infestation. The crops produced in small pockets include teff, maize, haricot bean, sorghum, and sugarcane. However, lack of rain and limited supply of inputs such as fertilizer and tractors further constrain crop production (OWMEB, 2018).

The Borana people have traditionally depended on livestock rearing. It is a source of cash, milk, and meat, as well as prestige. However, the number of livestock is declining due to scarcity of feed and water. Land degradation, genetic erosion, climate change and prevalent diseases are cited as key reasons for the increased scarcity of feed and water. The sales of livestock and their products at local markets constitute a significant portion of household income. However, reductions in weight of livestock and corresponding low market prices, weak market linkages and pastoral extension services are among the challenges the community is facing. As a result, many people in the semi-arid agro-climatic areas are temporarily or permanently in a state of food insecurity and depend on food aid (OWMEB, 2018).

The average monthly income of about 82% of the households in both urban and rural areas in the region is below Birr 3,000, while about 10% of households earn between Birr 3,000-5,000, and only about 6% of households earn over Birr 5,000 (OWMEB, 2018).

There is water shortage in the zone and is extreme in the low-lying areas, in terms of quantity, quality and access. In these areas, rainfall is irregular, and streams are rarely available – and, if present, are usually seasonal. As a result, individuals, and sometimes even all family members, often migrate or travel long distances to obtain water for their families and livestock. Communities share the same sources of water with livestock and wildlife because of tradition as well as scarcity (OWMEB, 2018).

As a coping mechanism for water scarcity and other external shocks, man-made traditional ponds, *Eela*, which are used as the major sources of water for both humans and livestock, are very common. As an additional coping mechanism, farmers often seasonally migrate from the south toward the north of the zone with their herds, where grazing is better. Both people and livestock spend long hours under tree or bush shades during intense 'sun storms' (OWMEB, 2018).

The existing sources of water include man-made water wells or ponds (*Eela*), groundwater harvesting, cisterns, unprotected springs, roof-water harvesting, unprotected wells, protected wells, and public taps. Of these water sources, ponds account for 49%, public taps 21% and unprotected springs 11%. Most of the sources have been developed by NGOs and the government, at different times, to supply water to the surrounding populations, including livestock. However, these water sources are few in number (21 deep wells, 21 hand dug wells and 6 developed springs) and have low capacity to serve the entire community. About 26.4% of the community has access to private and public tap, and protected wells and springs. 16.3% of the community use unprotected wells and springs, while 3.2% harvest rainwater. The remaining obtain their water from ponds and rivers. Many people – typically, women – walk at least 15 kilometers to obtain potable water. In addition, they pay up to 30 ETB /20 liters of water to local vendors in many localities (OWMEB, 2018).

In times of need, the Borana community migrate to other areas within the Borana zone, to the adjacent West-Guji zone and even beyond to the Southern Nations, Nationalities and Peoples Regional State. During drought and other climate shocks, migration in search of water for up to 40km (6 hours or more) is common. Women and girls are the most affected groups, and they have the highest share in search of water from long-distant sources (OWMEB, 2018).

Based on the responses collected during a 2018 survey, the daily amount of water consumed per household is in the range of 6-26 liters. Approximately half (52.7%) of households use between 6-10 liters per day, 15% use 12-20 liters and 2.3% use 25-26 liters. The mean average consumption is 10 liters per day (OWMEB, 2018). The WHO defines 5.3 liters/person/day as inadequate access with very high health concern (Howard G. et al., 2020).

Student enrollment and participation rates at primary and secondary schools are below 75%. The net enrollment rates at primary (65%) and secondary (15%) schools in Borana are lower than those at the national level, which are 97% and 25% for primary and secondary schools, respectively (OWMEB, 2018).

Borana zone has a total of 502 primary and secondary schools, 3 technical and vocational education and training (TVET) institutions and 1 university. In the primary and secondary schools, 53% of the students are male and 49% are female. However, in the TVETs and university the participation of female students is

low: 13% and 14%, respectively. Only 29% of the teachers in the entire education system are female (OWMEB, 2018).

The main reasons for the low enrollment and participation rates are demand for child labor, the distance of schools from residential areas, occasional conflicts, lack of school facilities (houses for students and teachers) and early marriage, along with low awareness of the importance of education (OWMEB, 2018).

In addition, no education institutions have permanent water supply services or sources. For example, Borana University uses truck-mounted tankers to supply water. A small number of schools try to collect rainwater with the support of NGOs operating in the area; however, their reservoirs are small and can only be used for urgent cases (OWMEB, 2018).

Both water-borne (diarrhea, cholera, typhoid, giardiasis, amebiasis) and vector-borne (malaria) diseases are prevalent in Borana. However, no health institutions have water supply and this needs to be addressed urgently for effective services, including child delivery and treatments (OWMEB, 2018).

Women spend more time on cooking food, cleaning houses, collecting firewood, fetching water and childcare, as well as buying and selling at local markets, whereas men spend more time on preparing farmland, tending livestock, construction of houses and road maintenance. Estimated daily average working hours for men are between 8-12 hours; for women, it is 12 hours or more. Although men also participate in household tasks, the extent of their support varies and depends on individual inclination. For example, whereas 79% of adult women state they have responsibility for fetching water, only 3% of adult males indicate that fetching water is their responsibility (OWMEB, 2018).

In rural areas, lack of time, lack of access to safe water, shortage of credit and saving services to establish small enterprises, and lack of experience in establishing small enterprises are the challenges cited by women. In urban areas, there are some experiences in participating within cooperatives and unions organized around agriculture and saving and credits. There is also potential for women participate in water users' associations and benefit from water supply projects (OWMEB, 2018).

V. Sexual Exploitation, Abuse and Harassment

The Government of Ethiopia through its Ministry of Women and Social Affairs (MoWSA) has drafted a Women Empowerment and Gender Equality policy which has provisions for Gender Based Violence. The policy is currently under review and once approved all public institutions including Ministry of Finance (MoF) are required to apply it.

The Ministry of Finance (MoF) has an employee code of conduct which states:

- Committing, attempting or facilitating conditions for sexual harassment, abuse, and/or violence, against a colleague or customer shall be penalized;
- Employees and heads shall not abuse their authorities and apply such authorities to get personal interests.

Further, in order to ensure Sexual Exploitation, Abuse and Harassment (SEAH) does not undermine the well-being of the communities and other stakeholders who will be involved in this project, guidelines are recommended to be in place. Specifically, the following potential risks are identified along with recommended mitigation actions:

1. Lack of awareness of what SEAH constitutes and how it needs to be addressed

Create awareness on prevention, handling and monitoring of SEAH in collaboration with MoWSA and its regional and woreda level offices. This will be done to all those involved at federal, region and woreda levels by having dedicated sessions during project implementation team meetings.

2. Risk of SEAH during project delivery including trainings, irrigation system placements etc.

- Put in place a screening process to identify project activities that might have high risk of SEAH.
- Ensure any contracts to be signed between the project and partners (including project personnel) contain SEAH clauses.

3. Risk of violence against women within household due to increased women empowerment

- Have a dedicated SEAH sessions during community consultations including women-only consultations.
- Ensure they are clear on who to contact (and how) in case of any incidence.

4. Lack of reporting system

- Develop a Grievance Redress Mechanism for the project and ensure all stakeholders are aware of it.
- Ensure the reporting mechanisms are simple and safe.
- Ensure all stakeholders including contracted partners, project staff, government counterparts are required to report suspected or actual SEAH cases.
- Establish a safeguarding team at the project management level at the beginning of the project.
- Assign SEAH focal point both within the communities, project staff and women and social affair offices at the woreda level who will assist in reporting cases to the safeguarding team; this will support smooth communication and provide a sense of security to community members.
- Make different channels are available for reporting including telephone, in-person, police, community elders etc.
- The safeguarding team to advise on how to resolve reported cases and refer it to the police if necessary.
- All SEAH reports will be kept confidential to protect those involved.

5. Lack of follow up and proper documentation

- As part of its project monitoring, the AE will monitor the proper follow up of reported cases and how they are being kept.
- Reported cases will be included in the project report.
- Lessons learned through this process will be documented and be used to improve the project processes as well as future projects and programs of the AE.

VI. Recommendations

This gender assessment and gender action plan is prepared based on information from the available literature and stakeholder consultation. For Kobo, consultation has indicated irrigation as the priority of the community while potable water and irrigation were identified for Borana. Based on the challenges identified and prioritized during the stakeholder consultation, the following actions are recommended to contribute towards the empowerment of women and female headed households.

1. Gender analysis and baseline setting

Carry out gender analysis and establish baseline within the first two quarters of project implementation. It is recommended that a team which comprises at least the region and woreda project officers, the region and woreda women and social affair experts and the CRGE Facility gender specialist be established to carry out and oversee the gender analysis. This team will design the gender analysis process including key actors to be consulted in the process. Community representatives, women association representatives, relevant regional and woreda level government and non-government institutions, and any other relevant stakeholder need to be engaged in the process. Consultations planned under 2.1.1 and 2.1.2 on the GAP will be used to share and gather relevant information. The outcome of the gender analysis will be used to update/adjust the GAP as needed. Changes that are recommended, if any, will be shared with the GCF.

2. Project Implementing Team – Gender expertise

The CRGE Facility gender specialist will support the project coordinators at the federal level and provide oversight and guidance to ensure the implementation of the gender action plan (GAP).

MILLs Programme Coordination team will include a gender expert. A representative from the women and social affairs directorate of the ministry will be assigned to support and follow up on the project delivery focusing on the gender action plan.

The project officers at the region and woreda level will work with sector bureau and offices including the women and social affairs departments to implement the project. The assigned gender experts will be responsible to follow up the day-to-day implementation of the project focusing on the GAP and will have a necessary budget to support the project.

3. Consultations

All project consultations should take into consideration the importance of inclusive participation (with at least 33% of women participation in the first year and reaching 50% in subsequent meetings). Consultations should present and discuss the project activities, gender action plan, SEAH, roles and responsibilities of various stakeholders and the progresses made and challenges faced. It should also be used as a platform to sensitize men and boys in gender issues and ways to support women and girls in their households. Any lesson learned through this process will inform the project implementation throughout the life of the project.

Led by woreda and region project officers, and the region and woreda gender office representatives, at least one women-only consultations (at least 35% of members of `coops are women) per year will be organized at the project sites for the first two years of project implementation. This will enable women not only to voice their needs, ideas and challenges freely but also helps them to fully understand what their roles, responsibilities and rights are as members of the different cooperatives, including what they can do and whom to contact in case of SEAH incidents.

4. Access to irrigation and potable water

water user groups should make sure that at least 35% of the members (with the aim of reaching 50% by the end of the project) and 33% of the executive committee are women. This could be female headed households or female in male headed households. This is to ensure, that women are part of the decision-making process and that irrigation activities include women priorities.

In Borana, where the project also focuses on potable water, at least 50% of the female headed households should be able to access water from the rehabilitated wells.

5. Training

The project should carry out needs assessment and provide a number of trainings to make sure implementing personnel as well as beneficiaries have the capacity to fully deliver and benefit from the project. The following trainings are proposed:

- Technical and leadership trainings should be organized for elected officers (irrigation and water user groups) based on capacity needs
- Financial Literacy training should be organized for cooperative officers with additional training for women officers and members.
- Trainings targeting women specific needs, based on capacity needs, should be delivered for women officers and members.
- Region Women and Social Affairs bureau in collaboration with the CRGE facility to provide guidance for project delivery personnel (including region and woreda officers and key federal, region, woreda and kebele government offices) on how to deliver the GAP and align with the GCF gender policy
- Increased participation of women in all vocational training programs for local technicians of the project (at least 35%)

6. Lessons / knowledge sharing

Gender results, challenges and gaps identified through the project implementation should be documented and shared to inform subsequent initiatives.

7. Grievance

There should be a safeguard desk/committee established for the project with both men and women as part of the team responsible for receiving grievances. The grievances should be recorded and reported.

8. Monitoring and evaluation

Project activity and M&E reports include sex disaggregated data and gender results are evaluated and reported.

VII. Conclusion

As captured in this gender assessment, in Ethiopia women are given the majority of household responsibilities, including provision of water supply, energy for cooking and heating, and food security, in addition to the substantial amount of time they are required to spend on farming and livestock rearing. These responsibilities are more demanding for female-headed households, which have less labor and assets at their disposal. As a result, rural women are more vulnerable to, and less able to adapt to, drought, uncertain rainfall, floods and many other climate-related hazards.

Despite their significant role in supporting their households and the community at large, evidence shows that women have long been marginalized in major decision-making processes and have been exposed to norms and practices that further disempower them from being active, self-sufficient members of society.

These conditions have contributed to women's generally low access to education, health services and workforce participation, as well as other key resources and services.

A number of actions, both at policy and on-the-ground levels, have been implemented by different actors to address these challenges. Although commendable successes have been recorded in different sectors, considering the dire situation rural women are in, much more needs to be done if women are to be equal contributors to the country's social, environmental, and economic development while equally benefiting from the gains of development.

The GCF project aims to contribute towards baseline efforts on the ground by identifying actions that will equally benefit women, especially in the context of access to drinking water and irrigating farmland in the project area.

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Part II: Gender Action Plan for Kobo-Girana and Borana

Gender Action Plan for Kobo-Girana and Borana

No.	Activities	Baseline (to be established at the beginning of project)	Indicators & Targets	Timelines							Budget (USD)	Responsible Body / Remark*
				Y1	Y2	Y3	Y4	Y5	Y6	Y7		
1	**Establish baseline in Kobo-Girana and Borana**											
	Carry out gender analysis to establish baseline	Gender disaggregated data for current status of women's and FHH's level of participation in irrigation and agriculture cooperatives as well as proportions that have access to potable water not known	A team to design and carry out the gender analysis for each region established								20 000,00	project implementing team including woreda gender focal person + CRGE Facility**
			2 gender analysis conducted and report with recommendations produced for each region (consultations under 2.1.1 and 2.1.2 used to share and gather information)									
			Baseline established for each activity in the GAP and for any additional activity, for each region									
			GAP updated based on the outcome of the assessment (second quarter of first year)**									
2	**Component 1: Increased community resilience through sustainable access to clean water**											
2.1	**Deployment of submersible pumps & solar PV generation in Kobo-Girana and Borana**											
2.1.1	Inclusive public consultations on implementation plan and progress of the project including the gender action plan (3 times at each region)		At least 33% (first year of project implementation period) and 50% (starting the third year) of participants are women in each region								120 000,00	project implementing team including woreda gender focal person
			Consultations are held at times and places that are conducive to women participation, including availing a child care space									

			Representatives from the woreda and/or zone gender offices participate									
2.1.2	Conduct women-only consultations to ensure women freely express their views and needs		At least one woreda level women-only consultation conducted per year, in the first two years in each region								190 000,00	project implementing team including woreda gender focal person
2.1.3	Irrigation and water user groups (to manage irrigation systems in both regions and including potable water systems in Borana) formed with women participation		At least 35% of members are women								Part of project budget (under Annex 4 detailed budget 1.3.1 and 1.3.2)	project implementing team including woreda gender focal person
			Water user groups executive committees have at least 33% women representation									project implementing team including woreda gender focal person
			Water user groups' bylaws reflect a minimum of 35% female membership with the aim to increase that to 50% by the end of the project.									project implementing team including woreda gender focal person
			Water user groups' bylaw puts provisions to ensure women's membership and leadership positions are compatible with women's other responsibilities									project implementing team including woreda gender focal person
			Female representatives retained a minimum of 35% for the first year after establishment; and increased starting the 4th year to reach 50% by end of project									project implementing team including woreda gender focal person
2.1.4	Irrigation and water user group technical and leadership training conducted		Capacity needs assessed (considering potential differences based on gender)								Part of project budget (under annex 4detailed budget 1.3.3. and 1.3.4)	project implementing team including woreda gender focal person

	(at least one per year) in each region		At least one Technical and leadership training per year delivered to all officers starting the 4th year based on capacity assessment outcome								Part of project budget (under annex 4 detailed budget 1.3.3. and 1.3.4)	project implementing team including woreda gender focal person
			At least one training per year delivered to women members and officers starting the 4th year based on capacity assessment								Part of project budget (under annex 4 detailed budget 1.3.3. and 1.3.4)	project implementing team including woreda gender focal person
2.1.5	Sex disaggregated data collected and analysed in each region		Project activity and M&E reports include sex disaggregated data								Part of project budget (under annex 4 detailed budget for M&E)	project implementing team including woreda gender focal person + CRGE Facility
2.2	**Community-based water access in Borana only**											
2.2.1	Ensure female headed households have access to potable water		Survey shows at least 50% of the Female headed households (FHH) in the Borana project area report better access to potable water								Part of project budget (under annex 4 detailed budget for M&E)	project implementing team including woreda gender focal person
2.2.2	M &E reports capture the extent of Burden reduction in fetching water for women and girls in the project area		Women and girls in the Borana project area report reduced burden in fetching water								Part of project budget (under annex 4 detailed budget for M&E)	project implementing team including woreda gender focal person
2.3	**Resilient agricultural production by MSME businesses and cooperatives in Kobo-Girana and Borana**											
2.3.1	Public consultation to address the benefits, rights and responsibilities of participation in RuSACCO and discuss progresses conducted (to be planned as part of 2.1.1) in each region		At least 33% (first year of project implementation period) and 50% (starting the third year) of participants are women in each region								Part of budget under 2.1.1 above	project implementing team including woreda gender focal person
			12 consultations are held at times and places that are conducive to women participating									project implementing team including woreda gender focal person

			50 representatives from the woreda or zone gender offices participate									project implementing team including woreda gender focal person
2.3.2	Rural saving and credit cooperatives (RuSACCOs) formed/strengthened with women participation in each region		At least 35% of members are women								Part of project budget (under annex 4 detailed budget 1.4.1)	project implementing team including woreda gender focal person
			At least 33% of executive committees are women									project implementing team including woreda gender focal person
			At least 50% of the FHH in the project area are members									project implementing team including woreda gender focal person
			Cooperatives' bylaws reflect a minimum of 35% female membership with the aim to increase that to 50% by the end of the project									project implementing team including woreda gender focal person
			Cooperatives' bylaw puts provisions to ensure women's membership and leadership positions are compatible with women's other responsibilities									project implementing team including woreda gender focal person
			Revolving fund management and administration guideline/manual indicates 50% of beneficiaries to be women									project implementing team including woreda gender focal person
			At least 50% of the FHH in the project area report improvement of services from DAs									project implementing team including woreda gender focal person

2.3.3	Financial literacy training conducted in each region		At least one financial literacy training per year delivered to all officers in years 3, 4 and 5								Part of project budget (under annex 4 detailed budget 1.4.2)	project implementing team including woreda gender focal person
			At least one financial literacy training per year delivered to women members and officers in years 3, 4 and 5								Part of project budget (under annex 4 detailed budget 1.4.2)	project implementing team including woreda gender focal person
2.3.4	Sex disaggregated data collected and analysed in each region		Project activity and M&E reports include sex disaggregated data. Reports include information on all targets including for e.g. annual number of women beneficiaries of revolving fund with an explanation of unachieved results and ways to ensure achievement in subsequent years.								Part of project budget (under annex 4 detailed budget for M&E)	project implementing team including woreda gender focal person + CRGE Facility
3	**Component 2: Enabling Environment**											
3.1	**Policy & regulatory improvement/introduction in Kobo-Girana and Borana**											
3.1.1	For any new policy, framework strategies or standards to be introduced or improved for groundwater abstraction and use, review their gender-sensitivity and responsiveness and recommend revision as needed		Set up of two gender review committee comprising region and woreda project officers, region and woreda women and social affairs experts and CRGE gender specialist at each region								10 000,00	project implementing team including woreda gender focal person
			Policies/standards/strategies that are gender responsive adopted									project implementing team including woreda gender focal person
3.2	**Digitalization of MRV and payments in Kobo-Girana and Borana**											
3.2.1	Digital technology/MRV to provide gender disaggregated data		Number and type of gender specific activities/outputs reported through the MRV system for each region								Part of project budget (under annex 4 detailed budget 2.2.1)	project implementing team including

												woreda gender focal person
3.3	**Community based business models developed in Kobo-Girana and Borana**											
3.3.1	Financial products designed for each region taking the different roles of men and women in agriculture and water use and benefiting both equally		During community consultation of the design process 50% of those consulted are women								Part of project budget (under annex 4 detailed budget 2.3.1 - 2.3.4)	project implementing team including woreda gender focal person
			Training on business models and financial instruments provided to beneficiaries									project implementing team including woreda gender focal person
			Cooperatives and water-user groups that fulfil all gender related measures on their by-law and have greater women and FHH participation are given preferential access to financial products									project implementing team including woreda gender focal person
3.4	**Training and capacity development**											
3.4.1	Increased participation of women in all vocational training (operation and maintenance) programs for local technicians in each region		At least 35% of local technician trainees are women								Part of project budget (under annex 4 detailed budget 2.4.2)	project implementing team including woreda gender focal person
3.5	**Knowledge-sharing and coordination platform**											
3.5.1	Gender related lessons captured and shared through different mechanisms		Identify key stakeholders and design appropriate knowledge sharing mechanism								Part of project budget (under annex 4 detailed budget 2.5.1 and 2.5.2)	project implementing team including woreda gender focal person + CRGE Facility

			Lessons captured and shared annually								Part of project budget (under annex 4 detailed budget 2.5.3)	project implementing team including woreda gender focal person + CRGE Facility
4	**SEAH**											
4.1	Ensure project is prepared for potential SEAH incidents at each regions		Dedicated SEAH sessions during project team meetings, community and women consultations								10 000,00	project implementing team including woreda gender focal person
			Safeguarding committee and SEAH focal points established									project implementing team including woreda gender focal person
			Checklist produced to identify/screen high risk project activities									project implementing team including woreda gender focal person + CRGE Facility

*the CRGE facility's gender specialist and representatives of the region/woreda women and social affairs offices will be part of the project team and have the required finance to carry out their responsibilities

**the gender analysis for the two regions will be finalized within the first two quarters of the first year. The findings of the assessment, as well as the revised GAP with baseline information and any other required updates will be finalized and submitted to the GCF.

Annex I: List of Consulted Individuals

This document was based on desk research and stakeholder consultations, and was shared with gender focal persons of the CRGE Facility and the Ministry of Water and Energy for initial feedback. The revised document was presented at a consultation meeting held in April 2022. Below are the names and institutions of those who were involved in these processes.

No	Name	Organization
1	Abay Husen	Oromia Water and Energy (OWE)
2	Abebe Tamru	OWE
3	Addisu Bula	Amhara Oromo Zone Natural Resource Department
4	Addisu Negash	Ministry of Agriculture (MOA)
5	Ahemd Galew Abtew	Amhara, South Wollo Zone Natural Resource Department
6	Andualem Bekele	Bureau of Finance (BoF), Amhara
7	Asnakew Yehuala	CRGE Finance coordinator, Amhara
8	Bantamlak Wondemu	CRGE coordinator, Amhara
9	Barok Kife Meshesha	Ministry of Water and Energy (MOWE)
10	Bihongn Semaw	Amhara kobo Girana coop representative
11	Daniel Reta	Borana Zone water and energy
12	Demelash Geleta	Oromia BoF
13	Dessalegn Tebratu	Environmental Protection Authority (EPA)
14	Estifanos Getachwe	Oromia Irrigation and Pastoralist Development Bureau
15	Fekadu Shentema	MOWE
16	G/medhin Shumiy	MOWE
17	Galm Adhense	Borena Yabello zone
18	Habtamu Denbobn	Environmental Protection Authority (EPA)
19	Jarso Qanchon	Borena Zone Agriculture Department
20	Kapital Jemal	Kemise Agriculture Department
21	Kasahun Wakoyo	EPA
22	Kedir Hussein Seid	South wollo Agriculture Department
23	Leta Abate	Oromia Engineering corporation
24	Makeda W/Hiwot	National Disaster Risk Management Commission
25	Medhin Fissha	CRGE Facility, Ministry of Finance (MOF)
26	Mihretu Mohammed	Borena Zone water & energy
27	Misganaw Eyassu	CRGE Facility, MoF
28	Moges Getahun	Amhara kobo Girana project
29	Moges Sisay	Amhara NRS North Wollo Zone
30	Molla Melesse	Amhara NRS North Wollo, Kobo Girana project
31	Nega Ashagrie	EPA
32	Nibertu Molla	Amhara BOF
33	Nigus Agonafir	MOWE

34	Samson Emeru	Ministry of Agriculture (MoA)
35	Sebelewerk Mulat	Amhara Bureau of Finance (BOF)
36	Senayt Zinebu	Amhara kobo Girana coop representative
37	Sisay Abebe	OWE
38	Solomon Alemu	MOA
39	Solomon Ali	OWE
40	Tafese Tesfaye	MoWE
41	Teferi Daba	Oromia pastoralist development bureau
42	Temesgen Abera	National Meteorology Agency (NMA)
43	Terefe Damessa	MOWE
44	Tesfaye Lulie	MOWE
45	Teshale Bekana	OWE
46	Tsegaye Alemu	Ministry of Irrigation and Lowland
47	Workinesh Gashie	MoWE
48	Zebene Worku	Ministry of Irrigation and Lowland
49	Zebider Alemneh	MOWE
50	Zewdu Dadi	BoF