



**GEF-6 REQUEST FOR PROJECT ENDORSEMENT/APPROVAL**

**PROJECT TYPE: Full-sized Project**

**TYPE OF TRUST FUND: Least Developed Countries Fund**

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**PART I: PROJECT INFORMATION**

Project Title: Mainstreaming climate risks considerations in food security and IWRM in Tsilima Plains and Upper Catchment Area			
Country(ies):	Eritrea	GEF Project ID: <sup>1</sup>	6923
GEF Agency(ies):	UNDP	GEF Agency Project ID:	4633
Other Executing Partner(s):	Ministry of Land, Water and Environment	Submission Date: Resubmission	29 June 2016 1 August 2016
GEF Focal Area (s):	Climate Change	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/>		Corporate Program: SGP <input type="checkbox"/>
Name of Parent Program	[if applicable]	Agency Fee (\$)	859,750

**A. FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES<sup>2</sup>**

Focal Area Objectives/Programs	Focal Area Outcomes	Trust Fund	(in \$)	
			GEF Project Financing	Co-financing
CCA-1	1.2: Reduced vulnerability to climate change in development sectors.	LDCF	5,020,000	15,600,000
CCA-2	2.1: Increased knowledge and understanding of climate variability and change-induced threats at country level and in targeted vulnerable areas.	LDCF	2,015,000	5,700,000
CCA-3	3.1: Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas.	LDCF	2,015,000	6,200,000
<b>Total project costs</b>			<b>9,050,000</b>	<b>27,500,000</b>

**B. PROJECT DESCRIPTION SUMMARY**

<b>Project Objective:</b> To integrate adaptation measures into ecosystem restoration and agricultural production systems to address climate change in Eritrea and secure the benefits of the National Food Security Strategy and IWRM Action Plan.						
Project Components/ Programs	Financing Type <sup>3</sup>	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Confirmed Co-financing
Component 1. Information on the impact of ecosystem degradation in aggravating vulnerability to climate change risks and reducing resilience of development gains understood and integrated into key decision-making processes.	TA/INV	1.1 Capacity of research institutions to undertake climate-related research increased	1.1.1 Capacity and resource needs assessment undertaken and capacity development strategy and training programme developed and implemented for NARI, which includes training on climate change and water resources management, as well as research/data collection, analysis and packaging/publication of information.  1.1.2 Network and	LDCF	\$1,820,000	\$5,397,503

<sup>1</sup> Project ID number remains the same as the assigned PIF number.

<sup>2</sup> When completing Table A, refer to the excerpts on [GEF 6 Results Frameworks for GETF, LDCF and SCCF](#).

<sup>3</sup> Financing type can be either investment or technical assistance.

			<p>information sharing platform on CCA and climate-smart agriculture (CSA) developed at national, Zoba and sub-Zoba levels.</p> <p>1.1.3 Technical and financial support provided to NARI (in association with other academic and research institutions) for conducting research and producing research outputs/products on CSA and production systems, including but not limited to: i) drought resistant and early maturing crops; ii) sustainable water use and conservation practices; iii) conservation agriculture practices, including tillage management and soil fertility; iv) sustainable landscape management; and v) livestock production and grazing management.</p> <p>1.1.4 Climate information and monitoring systems developed in association with relevant line ministries, departments – in particular, the Meteorological Services Unit – and local communities based upon data received from hydro-meteorological stations installed under Output 2.2.2.</p>			
		1.2 Capacity of extension service institutions to provide knowledge-based climate-smart extension services to arable agriculture, livestock production and water management increased	<p>1.2.1 Capacity and resource needs assessment, development and training programmes implemented within institutions involved in extension services on <i>inter alia</i> sustainable land, forestry and water resources management.</p> <p>1.2.2 Extension packages reviewed and updated to include best practices and climate-smart approaches through the provision of technical and financial support at national, Zoba, sub-Zoba and Kebabi levels.</p> <p>1.2.3 A long-term strategy developed and</p>			

			implemented for monitoring and evaluating climate-smart: i) water resources use and management; ii) crop productivity; and iii) livestock productivity.			
Component 2. Climate-resilient land-use planning to support the adoption of climate-smart agricultural and ecological interventions.	INV	2.1 Climate-resilient land use planning implemented over 9,000 hectares of the Tsilima Region.	<p>2.1.1 Based on the assessments undertaken in Output 2.2.1: i) identify and map drought and flood prone areas; and ii) develop and implement community-based land use and area development plans in the Tsilima Region.</p> <p>2.1.2 Existing CBOs strengthened, including <i>inter alia</i> Village Agricultural Committees, Water User Associations and Farmer Associations to coordinate local level participation in climate change adaptation, land use and development planning.</p> <p>2.1.3 Technical support provided to the Zoba and sub-Zoba administration to inform implementation of the land redistribution process through the: i) classification of land according to potential land uses; ii) mapping of coordinates; and iii) assessment of the availability and quality of resources (e.g. soil and water).</p>	LDCF	\$7,055,000	\$21,056,191
		2.2 Integrated water management operationalised across the Tsilima Region, increasing water availability and land under irrigation.	<p>2.2.1 Groundwater and surface water resources assessment undertaken and a groundwater monitoring strategy (including a system of data collection and information exchange on water use and projected demand) developed and implemented in the Upper Mereb catchment.</p> <p>2.2.2 Hydro-meteorological stations established and/or refurbished at Mendefera, Dbarwa and Halhale.</p> <p>2.2.3 Climate-smart watershed restoration and management measures identified and</p>			

			<p>implemented, including: i) water harvesting and storing interventions; ii) flood diversion and water spreading facilities; and iii) on-farm and off-farm soil and water conservation measures.</p> <p>2.2.4 Local communities and households trained to undertake sustainable water use and management, including <i>inter alia</i> water harvesting, construction and maintenance of hard and soft engineering interventions.</p>			
		2.3 Increased food production through the implementation of climate-smart agricultural practices across the Tsilima Region.	<p>2.3.1 Climate-smart agricultural practices – informed by research products generated under Output 1.1.3 and land use and area development plans prepared under Output 2.1.1 – developed and transferred to farmers, including :i) drought- and disease-resistant varieties; ii) integrated crop-livestock production systems; iii) conservation agriculture; iv) agroforestry; v) silvopasture; and vi) rangeland and livestock management.</p> <p>2.3.2 Alternative income-generating livelihoods identified and implemented in selected communities</p>			
Component 3. Knowledge management and awareness raising.	TA	3.1 Increased monitoring, knowledge-sharing and awareness at Zoba, sub-Zoba, Kebabi and community levels on: i) climate change risks; ii) climate- and ecosystem-smart watershed restoration; iii) climate-smart agricultural technologies and measures; and iv) the sustainable use and management of natural resources.	<p>3.1.1 Public awareness-raising and education campaigns conducted in the Tsilima Region using all forms of media (including <i>inter alia</i> print, radio, art and drama)</p> <p>3.1.2 A communication strategy developed and implemented to collect and disseminate knowledge and best practices on: i) climate- and ecosystem-smart watershed restoration; ii) climate-smart agriculture; iii) sustainable land management; and iv) natural resource use</p> <p>3.1.3 A strategy developed</p>	LDCF	\$130,000	\$385,536

			and implemented for: i) scaling up lessons learned to other Zobas, sub-Zobas and Kebabis; and ii) informing decision-making at national level.			
			3.1.4 A gender strategy developed and implemented, which includes capacity building and enhancing the participation of women in planning, selecting, implementing adaptation measures and monitoring their success.			
Subtotal					\$9,005,000	\$26,839,230
Project Management Cost (PMC) <sup>4</sup>				(select)	\$45,000	\$660,770
<b>Total project costs</b>					<b>\$9,050,000</b>	<b>\$27,500,000</b>

**C. CONFIRMED SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE**

Please include evidence for co-financing for the project with this form.

Sources of Co-financing	Name of Co-financier	Type of Cofinancing	Amount (\$)
GEF Agency	UNDP	Grants	\$2,500,000
Recipient Government	GoSE	Grants / In kind	\$25,000,000
<b>Total Co-financing</b>			<b>\$27,500,000</b>

**D. TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS**

GEF Agency	Trust Fund	Country Name/Global	Focal Area	Programming of Funds	(in \$)		
					GEF Project Financing (a)	Agency Fee <sup>a)</sup> (b) <sup>2</sup>	Total (c)=a+b
UNDP	LDCF	Eritrea	CC	\$9,050,000	\$859,750	\$9,909,750	
<b>Total Grant Resources</b>				<b>\$9,050,000</b>	<b>\$859,750</b>	<b>\$9,909,750</b>	

a) Refer to the Fee Policy for GEF Partner Agencies

<sup>4</sup> For GEF Project Financing up to \$2 million, PMC could be up to 10% of the subtotal; above \$2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

## E. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS<sup>5</sup>

N/A - This project will contribute adaptation benefits as described under section A1 below.

## F. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? NO

(If non-grant instruments are used, provide an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF Trust Fund) in Annex D.

## PART II: PROJECT JUSTIFICATION

### A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN WITH THE ORIGINAL PIF<sup>6</sup>

There have been no changes in terms of the GEF/LDCF strategic focus or eligibility since the original PIF. The LDCF-financed project is consistent with LDCF Objectives CCA-1 “Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level”, CCA-2 “Increasing adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level” and CCA-3 “Adaptation Technology Transfer: Promote transfer and adoption of adaptation technology”.

Changes have been made in terms of the alignment of the project document with the original project design of the PIF, in terms of structure. These changes were made based on stakeholder consultations and reflect changing national circumstances since the PIF was developed. The wording of various outcomes has been amended to make them more specific and relevant to the current national context as well as to fit stakeholders’ specific needs. In addition, the references to indicators and targets in the outcome descriptions have also been removed to make them more concise, and the indicators and targets have been moved to the Project Results Framework as appropriate (see section VI of PRODOC). However, while the exact wording of the outcomes may have changed, there has been no change in their focus and they remain based upon the same underlying principles. The consultations were used to refine the outcomes and outputs in order to achieve the desired developmental outcomes in accordance with the original PIF (see Annex M-Baseline Report for further details on stakeholder consultations). Furthermore, Component 3 on *Knowledge Management and Awareness-raising* has been added to the project design to address the need for a strategic focus on knowledge management, information sharing and awareness-raising. The revisions to the outcomes are detailed in the table below.

Identification Form	Document	Document /CEO Endorsement Request
Project component/expected outcomes	Project component/expected outcomes	Justification of the change to the PIF
Component 1: Information on the impact of ecosystem degradation in aggravating vulnerability to climate change risks and reducing resilience of development gains understood and integrated into key decision-making processes.	Component 1: Information on the impact of ecosystem degradation in aggravating vulnerability to climate change risks and reducing resilience of development gains understood and integrated into key decision-making processes.	No changes.
Outcome 1.1 Capacity of research institutions to undertake climate-related research increased by over 50% as measured by changes in UNDP Capacity Scorecard.	Outcome 1.1 Capacity of research institutions to undertake climate-related research increased.	The outcome has been reworded to be more concise, but the underlying principle remains unchanged. The reference to a 50% increase in capacity was removed as it was somewhat unrealistic. The target institution (National Agricultural Research Institute) in this case has almost no capacity (mostly scoring 2 - <i>Anecdotal evidence of capacity</i> in the UNDP Capacity Scorecard) to conduct research. As described in detail in Component 1 (Outcome 1.1) of the PRODOC and below and detailed in the results of the Capacity Assessment Scorecard (see Annex L of PRODOC), a significant amount of support is required to bring NARI to a 50% score, and this support

<sup>5</sup> Update the applicable indicators provided at PIF stage. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the [GEF-6 Programming Directions](#), will be aggregated and reported during mid-term and at the conclusion of the replenishment period.

<sup>6</sup> For questions A.1 –A.7 in Part II, if there are no changes since PIF, no need to respond, please enter “NA” after the respective question.  
GEF6 CEO Endorsement /Approval Template-Sept2015

		would have to be multi-faceted and long term, and is beyond the capacity of this project. Based on these conclusions, the focus in the project is therefore to provide specific support to NARI to build its capacity to conduct research within the context and constraints of this project. The priority will therefore be given to climate-smart research to inform the mainstreaming of climate risk into the agriculture production and water management sectors, in line with the project focus on food security and IWRM.
Outcome 1.2 Capacity of extension service institutions to provide knowledge-based climate-smart extension services to agriculture, livestock production and water management increased by over 50% as measured by changes in UNDP Capacity Scorecard.	Outcome 1.2 Capacity of extension service institutions to provide knowledge-based climate-smart extension service to agriculture, livestock production and water management increased.	<p>The outcome has been reworded to be more concise, but the underlying principle remains unchanged.</p> <p>Similar to Outcome 1.1, reference to a increase in score by 50% was removed because it is unrealistic based on the capacity assessments undertaken during the PPG (See Annex K – Capacity Assessment Scorecard for the Agricultural Extension Department of the Ministry of Agriculture). The Extension service institutions currently have limited capacity to provide services to farmers, as discussed in detail under Component 1 of the of PRODOC. The average score for the Department was 1 (<i>No evidence of capacity</i>), and the target to increase this capacity by 50% within the time and resource constraints of the project is therefore limited, and would require more comprehensive and multi-faceted support, including targeted budgetary support from the parent ministry, and a strategy for systematic and ongoing capacity building. In light of this, the project will focus on training and capacity building specific to the provision of climate-smart advice to farmers and improved coordination between the generation of knowledge (NARI) and the use of such knowledge (by MOA, through the AED) to promote the uptake and adoption of climate-smart agricultural practices by farmers within the Tsilima region, and over time, the rest of Eritrea.</p>
Component 2: Incentives in place leading to adoption of long-term measures for watershed rehabilitation, groundwater recharge, climate-smart agricultural and livestock production practices.	Component 2: Climate-resilient land use planning to support the adoption of climate- and ecosystem-smart agricultural and ecological interventions.	The component wording has been modified to highlight support to climate-smart land-use planning and management. The focus on the agriculture and water sectors are maintained. The focus on land-use planning is key as it facilitates the creation of an enabling environment at the planning level through the land-use plans that integrate all aspects of land use. The new wording of the component moves the focus away from direct incentives tied to security of tenure for practical reasons that became apparent during the PPG, as explained below.
Outcome 2.1 Security of tenure improved for the communities of plains covering over 9,000 hectares ( <i>number of households and exact means of verification to be established during PPG</i> )	Outcome 2.1 Climate-resilient land-use planning implemented over 9,000 hectares of the Tsilima Region.	<p>The focus of the PIF was to directly support the redistribution of about 9,000 hectares of land to individual families on a permanent basis, as successfully piloted under another GEF-financed project in a different site within Eritrea (GEF ID 3364, UNDP ID 2979).</p>

		<p>During the PPG phase however, it became apparent from consultations with the Ministry of Land, Water and Environment, as well as other stakeholders that it is beyond the scope of this project to address issues pertaining to the security of tenure. UNDP was specifically requested by the government to not address land redistribution issues under any project, and informed that the government will directly implement the 1994 Land Proclamation. The wording of the Component and Outcomes was therefore amended to make them more attainable. That said, the project will still make significant contribution to informing the process of land redistribution through 2.1.3 (<i>Technical support provided to the Zoba and sub-Zoba administration to inform implementation of the land redistribution process through the: i) classification of land according to potential land uses; ii) mapping of coordinates; and iii) assessment of the availability and quality of resources (e.g. soil and water)</i>) by conducting land classifications and mapping, as well as resource assessments in line with the requirements of the Land Proclamation as discussed in detail under Outcome 2.1. The lack of capacity (skills, equipment and manpower) to conduct land classifications, mapping of coordinates and resource assessments, has been identified as the primary barrier to implementing the 1994 Land Proclamation. The results of the work to be conducted under this output will, therefore, provide the scientific basis for land allocation decisions to be taken by the government, and unlock the process of implementing the land redistribution policy. The land use plans to be developed under this component will therefore have a long-term impact on government's land reform process and contribute, albeit indirectly, to the incentives for SLM investments.</p>
<p>Outcome 2.2 By 2018, the amount of water available for irrigation increases by 30% over current baseline (of 28 million cubic metres) increasing the area under irrigation from 400 ha to about 1,000 ha) <i>baseline and target to be confirmed in PPG</i></p>	<p>Outcome 2.2 Integrated water management operationalised across the Tsilima Region, increasing water availability and land under irrigation.</p>	<p>The wording of this outcome has been amended slightly to reflect the broader scope of the EbA activities that will be undertaken that will result in an increase in the availability of water and land under irrigation. The reference to the increase in percentage of water and land under irrigation has been utilised as an indicator in the Results-based Framework for Outcome 2.2 to make tracking of products or services from outputs easier during implementation. The proposed targets will therefore be used to measure the progress of the project activities.</p> <p>During the PPG, the area under irrigation was estimated to be 1,352ha (i.e. baseline), indicating an underestimation at the time of writing the PIF. A target by end of project has been set at 1,952ha.</p>



<p>Outcome 2.3 By 2018, more than 75% of farmers take up climate smart farming technologies and food production has increased by 30%, while livestock productivity increases by at least 30% (baseline determined at PPG); this leads to: i) over 75% of project beneficiaries have sufficient food and livestock products for most of the year; ii) an improved score on the “Vulnerability and risk perception index, disaggregated by gender”</p>	<p>Outcome 2.3 Increased food production through the implementation of climate-smart agricultural practices across the Tsilima Region.</p>	<p>The wording of this outcome has been amended slightly to emphasise the broader goal of increased food production, in line with the National Food Security Strategy (NFSS). This outcome will however be pursued through the implementation of a suite of climate-smart agriculture and water management approaches at both farm and landscape levels, that are envisaged to increase productivity and reduce the vulnerability of farmers, households and the agricultural production sector in general.</p>
	<p>Component 3. Knowledge management and awareness raising.</p>	<p>An additional Component and outcome have been added to support knowledge management, information sharing and awareness-raising activities in Eritrea. The activities under this component will promote education and awareness on climate change adaptation and the associated benefits in building the resilience of communities and ecosystems – while simultaneously improving community livelihoods.</p>
	<p>3.1 Increased awareness and understanding of the impacts and risks of climate change on ecosystems and agro-pastoral livelihoods.</p>	

A.1. *Project Description*. Elaborate on: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed; 2) the baseline scenario or any associated baseline projects, 3) the proposed alternative scenario, GEF focal area<sup>1</sup> strategies, with a brief description of expected outcomes and components of the project, 4) [incremental/additional cost reasoning](#) and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and [co-financing](#); 5) [global environmental benefits](#) (GEFTF) and/or [adaptation benefits](#) (LDCF/SCCF); and 6) innovativeness, sustainability and potential for scaling up.

Adaptation problem: The Tsilima Region – part of the densely populated Central Highlands agro-ecological zone – is known for its agricultural products, such as sorghum and barley, it is considered the breadbasket of Eritrea, and is the focus of the government’s current and future investments in food security. Being densely populated, the region’s ecosystems and natural resources face increasing pressure. In addition to this, climate change poses an additional threat to ecosystem goods and services – and therefore agricultural productivity and community livelihoods – in this area. Like many parts of the Africa, Eritrea, being located in the Horn of Africa, is currently facing climate change-induced threats to ecosystem services and agricultural productivity, and these are compounded by the impacts of significant land degradation occurring in the country. In the Tsilima Region, these problems manifest through reduced groundwater recharge, which affects agricultural productivity. This is partly a result of decreased precipitation, shorter and more intense rainy seasons, which reduce the potential for infiltration, promotes run-off, and increased temperatures that promote evapotranspiration. It is also a result of over-abstraction of groundwater within short periods, reducing the opportunities for natural recharge of groundwater aquifers and deforestation, leading to reduced capacity of soils to retain moisture and nutrients.

The project’s objective is therefore to integrate adaptation measures into ecosystem management and restoration and agricultural production systems to secure the benefits of the National Food Security Strategy (NFSS) and Integrated Water Resources Management (IWRM) Action Plan. By doing so, the LDCF-financed project will support the implementation of Priorities 3, 4 and 5 of Eritrea’s National Adaptation Programme of Action (NAPA) – which focus on livestock, forestry and water resources respectively. Furthermore, the project will mitigate the effects of floods and droughts, contribute to reduced soil erosion and increase soil fertility. Communities in the Tsilima Region will therefore be less vulnerable to the effects of climate change. The project will achieve this by enhancing the scientific and technical capacity of government staff – at national, Zoba and sub-Zoba levels – as well as academic and research institutions to identify, plan and implement climate change adaptation (CCA) interventions. This will facilitate the implementation of an ecosystem-based approach to CCA in sub-Zoba Dbarwa, in the Tsilima plains and upper catchments. The theory of change adopted for this LDCF-financed project comprises addressing the barriers discussed below and in Section II (Development Challenge) of the Project Document while contributing to the preferred solution discussed below through the delivery of three interrelated components.

Root causes and barriers:

The majority of Eritrea’s population resides in rural areas, and subsist on agriculture, both rainfed and irrigated. The Food Security Strategy (2004) highlights main sources of vulnerability for the people of Eritrea as external and internal shocks that include: (a) food insecurity (due to drought, pest infestation or military conflict); (b) dependence on a single source of income and employment

(agricultural-based source of livelihood is vulnerable to drought, pests, degradation of natural resources and fragmentation of small holder farms); (c) lack of access to basic social services and infrastructure (in particular water during drought conditions); (d) lack of access to productive assets (land, credit and farm equipment) and markets; and (e) lack of adequate social safety nets to protect the socially and economically vulnerable persons. In the Tsilima region, 80% of the population resides in villages and in the countryside, and are generally poor. It is these households that are largely dependent on natural resources and the ecosystem goods and services they offer, that are most vulnerable to the impacts of resource degradation and climate change. 57% of the households in the project catchment area are headed by women, and these households are the poorer and more vulnerable section of the society, and particularly affected by the impacts of climate change because they rely on rain-fed agriculture and lack the financial resources to employ other means to improve agricultural productivity (e.g. groundwater resources for irrigated agriculture).

There are multiple institutional, technical and financial barriers in Eritrea to addressing and managing the effects of climate change. In 2006, a National Capacity Needs Self-Assessment for Global Environmental Management (NCSA) was undertaken. This assessment noted that the relevant ministries – including Ministry of Land, Water and Environment (MOLWE) and Ministry of Agriculture (MoA) – are in need of additional staff with updated skills. The NCSA also identified capacity gaps including: i) weak inter institutional coordination and communication; ii) inadequate technical and scientific capacity to implement climate change adaptation (CCA) interventions; iii) inadequate funding; and iv) inadequate research and training. The LDCF-financed project will contribute to the preferred solution by implementing a suite of complementary measures to address the barriers described below.

- *Limited inter-institutional coordination with regards to planning for climate change adaptation:* An effective national response to climate change requires coordination between relevant ministries and institutions, including inter alia the MOLWE, MoA, Ministry of Transport and Communication (MoTC), and the National Agricultural Research Institute (NARI). There has been limited coordination between government departments, academic institutions and climate change projects in Eritrea. Efforts to improve coordination between the MOLWE and MoA are restricted by challenges such as inadequate human resources. The shortage of skilled staff has hindered the coordination of donor-funded environmental and climate-related projects, as well as the implementation of multi-lateral environmental agreements. Consequently, there is a need to mainstream climate change into sectoral policies, strategies and development plans.
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- *Limited institutional and technical capacity to plan and implement climate change adaptation interventions:* Although climate change is recognised as a matter of national importance within Eritrea's NAPA, the technical and scientific knowledge and understanding of climate change and adaptation within the country is limited, although efforts to enhance them have been noted. This has restricted the ability of Agricultural Extension Department (AED) - within the MoA – to assist farmers in employing the appropriate and responsive strategies and tools for adapting to climate change. Furthermore, the ability to utilise various models to produce a range of projections for Eritrea, prepare seasonal forecasts and issue early warnings is challenged by shortage of qualified meteorologists in the country. The shortage of skilled personnel is partly attributed to the low number of graduates with a degree in either Mathematics, Physics or Statistics. Gaps in the technical capacity of government technical staff can also be attributed to: i) insufficient training of staff employed in relevant departments within the MOLWE and MoA; and ii) limited technical skills at the MOLWE, MoTC and MoA – particularly at the Kejabi level.
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- *Limited transfer of knowledge and technology:* There is no well-organised system for documenting and disseminating best practices for CCA. Furthermore, the provision of knowledge-based advice from extension agents to farmers is limited by the quantity and quality of information available to them. Coordination and communication between NARI and extension agents is intrinsically weak. These problems are compounded by limited feedback from farmers to extension agents regarding the performance of technologies or crop varieties developed by NARI. In addition, NARI's Information and Communication Unit (ICU) does not have well established links with other research institutions and there are no equivalent information and communication units within government departments in Eritrea at national and sub-national level. The transfer of knowledge and technology between institutions, extension agents, farmers and the community at large, is therefore limited.
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- *Inadequate scientific data, historical climate information and monitoring networks/stations:* During Eritrea's 30 year war for independence, many of the country's meteorological stations were destroyed and the Government of the State of Eritrea's (GoSE) ability to operate and maintain the hydro-meteorological network was severely constrained. At the end of the war in 1991, the collection of climate and weather data commenced on a regular basis. As a result, Eritrea has an absence of reliable climatic data to inform the development of accurate national climate change scenarios and subsequent adaptation planning in the country. The MoTC, MOLWE and MoA have subsequently established meteorological stations across the country. However, one of the legacies of Eritrea's colonial history is the lack of an institutional framework of systematic data collection and documentation with regards to climate, natural resources and the environment. An additional challenge to maintaining accurate and updated data is the variable development of Eritrea's infrastructure which hinders

the collection and transfer of data. The country's Initial Communication to the UNFCCC emphasises that the hydro-meteorological data collection activities currently rely on field equipment with a capability for automatic data recording, which is then physically transferred to the MSU for downloading. The transfer of such data is restricted by inadequate telecommunication infrastructure. Internet connectivity and mobile signals are restricted, particularly within the rural villages because of the topography and limited infrastructure. Subsequently, institutions do not have the facilities to acquire real-time data or access national, regional and international databases. This is a barrier to the comprehensive and effective use of climate information and dissemination of early warnings in Eritrea and limits appropriate responses to climate change.

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- *Limited knowledge and awareness of the value of ecosystems, climate change and climate change adaptation interventions:* There is limited knowledge and awareness of the role of ecosystems across Eritrea in reducing the negative effects of climate change, both at the household and government level. Furthermore, the Zoba and sub-Zoba administrations have limited knowledge on how an integrated approach to adaptation can increase the adaptive capacity of local communities to the effects of climate change. Limited knowledge of the benefits of such an approach is therefore a barrier to the effective planning and implementation of CCA interventions in rural areas. Ecosystem degradation resulting from unsustainable resource use by local communities is partly a result of limited knowledge of the benefits of maintaining functional ecosystems. For example, local communities are currently largely unaware that degradation of the watershed results in increased runoff, flash flooding, reduced infiltration, erosion and siltation.
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- *Insecurity of tenure reduces incentives for investing in climate-smart sustainable land management:* Farmers across Eritrea are unwilling to make long-term investments in land when such land will be reallocated to another farmer. In accordance with the traditional diessa land tenure system in the Tsilima Region, the reallocation of community land within villages occurs after a period of no more than seven years. The diessa system is perceived to be a barrier to farmers investing in cost-effective and sustainable measures of addressing climate change. Consequently, few farmers are planting trees on agricultural land or constructing/maintaining terraces, bunds and other soil conservation structures. Although the GoSE introduced legislation seeking to change the traditional diessa system, institutional (technical and financial) constraints have delayed its implementation, and in essence stalled the process. In particular, the Department of Lands (DoL) – which is responsible for the implementation of the Land Proclamation – has insufficient equipment for the mapping of land and conducting resource availability and quality assessments, which are preconditions for allocating land parcels for different uses. In addition, due to the sensitive nature of land governance, the Government of the State of Eritrea is rolling out implementation of the 1994 Land Proclamation slowly.
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- *Limited on-the-ground climate change adaptation interventions:* Currently, there are few CCA interventions being implemented in Eritrea. As a result, the benefits and cost-effectiveness of such interventions has not been sufficiently demonstrated to policy- and decision-makers. Without sufficient demonstration, it is unlikely that: i) CCA will be integrated into local and national policies, plans and legislation; or ii) local communities will support and contribute to CCA interventions. Technical protocols for implementing such interventions have not yet been produced because there is limited integration of climate change into natural resource management and ecosystem restoration. Therefore, institutions and ministries responsible for natural resource management and ecosystem restoration have limited access to nationally-appropriate tools or documents to guide them in the implementation of CCA interventions.

Baseline: Environmental concerns have historically been given a low priority in Eritrea in terms of research, policy and strategic planning. Limited funding for research and training – combined with inadequate equipment and facilities for research on climate change and extension services – have affected the capacity of relevant institutions to research, develop and implement CCA interventions or provide advice to farmers and land users. The NCSA recognises that the GoSE has insufficient capacity within relevant line ministries and institutions to: i) promote the use of national and global information on climate change research; and ii) develop and implement climate change education, training and public awareness campaigns. The majority of technical staff and extension agents do not have the skills or knowledge necessary to support and advise farmers on coping with the impacts of climate change. And at present, there are no systematic programmes or plans for updating the skills of extension agents to keep them apprised on new developments in the science and practice of CCA. A rapid capacity assessment was conducted for NARI during the PPG (see Annex L of PRODOC), and points to significant capacity constraints within NARI (the average score is 2- *Anecdotal evidence of capacity*). Another rapid capacity assessment conducted for the Agricultural Extension Department of the Ministry of Agriculture (see Annex K) indicated little to no capacity for provision of climate-smart advice (the average score is 1 - *No evidence of capacity*). Furthermore, technical packages promoted to farmers are generic, taking minimal cognizance of the differences in environmental and other conditions between the various agro-ecological zones, and between farming groups. The shortage of human resources within research institutions and the extension services – compounded by the limited availability of information, basic facilities and equipment – is a constraint on agricultural development and growth. Food security in Eritrea, particularly rain-

fed agriculture, therefore requires the reorientation of research and extension services to support smallholders in boosting their agricultural productivity.

Agricultural productivity of land and the effectiveness of soil and water conservation measures will be undermined by the predicted effects of climate change, especially an increase in droughts and floods. The availability of water is a constraint on agricultural productivity of land in the Tsilima Region. Despite sufficient WRD regulations, digging and drilling of wells is often unregulated due to inadequate enforcement capacity and the continuous pumping of water from these sources has led to a decline in groundwater levels as already observed in the Tsilima Region. Inadequate human resources within the WRD and existing spatial and non-spatial information systems constrain the assessment of water resources, data management and data exchange. As a result, the proper planning, development and sustainable management of Eritrea's water resources is not taking place. Inadequate knowledge regarding flood discharges and the sediment concentrations of flows undermines the effectiveness of current ecological interventions – particularly diversion structures and flood control measures. Consequently, diversion structures have been regularly breached and canal networks block with sediment deposits. These deposits reduce the amount of water that can be diverted and the overflow contributes to surface flow and subsequently soil erosion. In addition, the dimensions of earth embankments and bunds are insufficient. The predicted increase in frequency and intensity of rainfall events under climate change conditions will therefore undermine the effectiveness of these structures.

Knowledge and awareness of CCA and the associated benefits of building the resilience of communities and ecosystems – thereby improving communities' livelihoods – is likely to remain limited if information on CCA interventions is not shared at all levels. There is a low level of awareness and understanding within local communities regarding the predicted impacts of climate change in Eritrea and potential benefits of CCA interventions in reducing those negative impacts. The scarcity of awareness materials and poor integration of environmental matters into formal education programs and curricula limits public understanding of ecosystems and results in a weak civil society. Currently, there are no communication or outreach strategies providing information to stakeholders such as extension agents and farmers. In addition, CCA is not adequately integrated into new and existing national policies and strategies, nor are the potential benefits of adopting sustainable measures appreciated by government and local communities. This is exacerbated by the low capacity of national and local authorities to facilitate the implementation of such interventions, which will limit the replication and upscaling of CCA interventions – such as those demonstrated through this LDCF project – in other Zobas within Eritrea.

Few GEF and non-GEF funded projects that focus on adaptation to climate change or sustainable land, forestry and water resources management are currently being implemented in Eritrea. Over the past decade, large-scale public soil and water conservation works and reforestation programmes have been implemented involving farm and community forestry. These programmes have resulted in the protection of ~305,000 hectares of land in enclosures throughout Eritrea. In conjunction with ongoing GEF and non-GEF funded projects, these initiatives provide opportunities for synergies and knowledge exchange with the project. This LDCF-financed project is designed to build on these existing investments to generate adaptation benefits from two national initiatives and programs, in particular the National Food Security Strategy (NFSS) and the Integrated Water Resources Management (IWRM) Action Plan as described below.

- The **National Food Security Strategy (NFSS)** addresses food security at the household level and national level. The project will support the NFSS by developing and disseminating appropriate, climate-smart technologies that will enhance agricultural production and productivity. In addition, the project will develop climate-resilient land use and area development plans with the local communities, which will promote sustainable land and resource use. This overall support will also highlight the need for climate change mainstreaming into the food and agriculture production as an adaptation strategy at the national level.
- The **Integrated Water Resources Management (IWRM) Action Plan** is aimed at enabling Eritrea to systematically address water management issues. The overall objective of the IWRM Action Plan is to contribute to the implementation of integrated water resources management in Eritrea, which is aligned with government policies, laws and strategies. The project will support the IWRM Action Plan to improve the water resources information database by supporting the undertaking comprehensive baseline assessments and monitoring of water resources. In addition, the project will improve:  
i) the knowledge-base of water-resources; ii) understanding of the existing and projected demands for water; and iii) the capacity of water management institutions to manage both ground- and surface water resources. Information generated by the baseline assessments and ongoing monitoring will inform the management of watersheds, as well as the design of measures for the capture, storage and distribution of water. The total cost of the project portfolios is ~US\$ 19.8 million. The water sector is key to Eritrean's sustainable climate change adaptation pathway, and so mainstreaming climate risk into this sector is key.

Proposed alternative scenario: The proposed alternative scenario in the project document is consistent with that proposed in the PIF. This is described in detail in Section III (Strategy) and elaborated in Section IV (Results and Partnership) of the Project Document. A brief description of the components, expected outcomes and outputs, as well as indicative activities is provided below.

### **Component One: Information on the impacts on ecosystem degradation in aggravating vulnerability to climate change risks and reducing resilience of development gains understood and integrated into key decision-making processes**

Total Cost: USD\$ 2,000,000

LDCF project grant requested: \$ 1,750,000; Co-financing (UNDP):\$ 250,000

The LDCF-financed project will support the institutions and departments spearheading the implementation of the NFSS and IWRM Action Plan to increase their capacity for researching, developing and implementing CCA interventions. In particular, the project will focus on building the technical and scientific capacity necessary to inform the development and implementation of such interventions. For example, research into climate-smart agriculture (CSA) could contribute to increased agricultural productivity by developing drought-tolerant and short-maturing crops. The research capacity of institutions will therefore be enhanced through provision of equipment and training of research staff. Furthermore, the project will identify and increase NARI staff and extension agents' opportunities for exposure, education and experience in climate-related fields of research.

As climate changes, so does the role of agricultural research, advisory and extension services. The predicted increase in rainfall variability and frequency of droughts and flooding in Eritrea requires a national effort to integrate climate-risks into extension packages. Under Outcomes 1.1 and 1.2, the LDCF-financed project will reorient extension services and research towards addressing climate risks. Based upon the information generated and capacity-building activities undertaken under Outcome 1.1, the project will enable extension agents to provide knowledge-based advice to farmers on how to adapt to climate change. The timely dissemination of such advice – as well as early warnings – will enhance the decision-making abilities of farmers and reduce their vulnerability to climate change.

The project will support the MoA's Agricultural Extension Department in revising the current extension strategy and approach to focus on establishing working partnerships with local farmers. It is recognised that the current approach of the extension services does not facilitate a mutual and sustained learning process. The role of improved extension services under the LDCF project will therefore be to facilitate a learning process in which farmers – as well as researchers, extension agents and input suppliers – are active participants rather than mere recipients of technologies and methods for CCA. The proposed participatory approach will require a shift in the role of extension agents from that of teachers to that of facilitators. This will be achieved through: i) establishing networks and linkages with other organisations; ii) continuous revision of extension packages to ensure that they are in line with current research findings and developments in the field of CCA; and iii) training of institutional staff to familiarise them with the new extension packages.

The updating and reorienting of extension services will result in technical staff and extension agents receiving knowledge and training on the necessary skills, tools and technologies to implement CCA interventions. In addition, the operational capacity of the extension services will be boosted to enable local communities within the Tsilima Region to mainstream climate change considerations into the implementation of baseline initiatives. Technical staff and extension agents will also engage with the local communities in the design and implementation of CSA and watershed restoration measures. In combination with awareness-raising campaigns under Outcome 3.1, effective advisory services and the closer involvement of extension agents in training, demonstrations and field activities will foster wider acceptance of CCA interventions. Consequently, these actions will also ensure the sustainability of the interventions beyond the duration of the project.

In summary, this component will strengthen the skills and decision-making capacity of institutions to promote the integration of climate change considerations into the selection of adaptation interventions and land-use planning at both the national and local levels. Consequently, the project will contribute to reducing the vulnerability of local communities in the Tsilima Region within sub-Zoba Dbarwa.

#### **Outcome 1.1: Capacity of research institutions to undertake climate-related research increased.**

Output 1.1.1: Capacity and resource needs assessment undertaken and capacity development strategy and training programme developed and implemented for NARI, which includes training on climate change and water resources management, as well as research/data collection, analysis and packaging/publication of information.

The LDCF-financed project will support NARI in undertaking comprehensive capacity and resource needs assessments to identify institutional and human capacity gaps in the planning and implementation of CCA interventions. A rapid capacity assessment was conducted for NARI during the PPG (see Annex L), and points to significant capacity constraints within NARI (the average score is GEF6 CEO Endorsement /Approval Template-Sept2015

2- Anecdotal evidence of capacity). This means building NARI's full capacity will require more than this project is able to support due to both time and resource constraints. The project will therefore support a comprehensive assessment that will assist in the identification and prioritisation of capacity needs, including needs to conduct research on climate change issues. In addition, opportunities will be identified for the integration of climate change information into decision-making on future research directions. Based upon the outcomes of the capacity needs assessment, a short-, medium- and long-term strategy for capacity development and training programs will be developed. These capacity-building activities will strengthen institutional and technical capacity to undertake climate-related research and improve the research-extension-farmer linkage.

Indicative activities under Output 1.1.1 include:

- Undertake a comprehensive capacity and resources needs assessment to identify gaps in staffing, skills and facilities within NARI for addressing climate change.
- Develop and implement a capacity development programme to bridge the capacity gaps identified in the above assessment through on-the-job training and engaging with local researchers on climate change.
- Provide technical and financial support to NARI based upon the results of the assessment.

*Output 1.1.2: Network and information sharing platform on CCA and climate-smart agriculture (CSA) developed at national, Zoba and sub-Zoba levels.*

The LDCF-financed project will enhance coordination and linkages between stakeholders by establishing a network and information sharing platform or forum/committee to facilitate cross-sectoral dialogue on climate change issues. The purpose of this cross-sectoral forum/committee will be to facilitate dialogue between research and academic institutions, relevant line ministries, donors, NGOs and community-based organisations (CBOs). The platform will therefore be an intermediary between researchers and decision-makers, translating scientific knowledge into practical guidance for decision-makers and will strengthen climate information generation and dissemination mechanisms. This will be achieved through: i) strengthening of the existing information and communication unit at NARI; ii) revitalisation of the National Food Information System; iii) re-establishment of Farmer Advisory Services; and iv) establishing and/or reinforcing linkages with international institutions working on CSA and climate change related research.

The project will also strengthen NARI's ICU with a focus on documenting local observations of climate change, climate risks and vulnerabilities. The ICU will monitor and document: i) NARI's research studies and findings; ii) the delivery of extension services; and iii) the CCA and climate-smart agricultural measures implemented under this project and other relevant initiatives.

The project will revitalise the National Food Information System (NFIS) at national level to address the lack of specific information on: i) climate change risks; ii) climate risk information generation and monitoring; iii) crop production estimates; iv) household food security and nutrition; v) food-relief management; and vi) market transparency. The purpose of the NFIS is to make the Early Warning Food Information System fully operational through undertaking medium- and long-term data collection and analysis. At the Zoba administration level, Zoba Food Information Committees will be established and strengthened to facilitate the development of a community-based EWS under Output 1.1.4.

MoA has established a Farmer Advisory Service (FAS). However; this has not yet been fully implemented because of limited technical capacity. The FAS is designed to be a farmer-led, village-based system with extension staff working directly with groups and associations of farmers. Through the FAS, extension agents will receive technical advice and support from specialists stationed at MoA branches at sub-Zoba and Zoba level. With extension staff stationed at sub-Zoba level, the Kebabi Administrator as well as Village Agricultural Committees (VAC) and Village Contact Farmers (VCF) will be actively engaged with agricultural extension services. As a result, these stakeholders will be directly involved in the development, implementation, monitoring and evaluation of options for CCA within farming systems. FAS will empower farmers through actively involving them in decision-making, co-financing and co-ownership of adaptation interventions. The success of FAS requires strong linkages between researchers and extension agents and the establishment of a village data base, which will be enhanced through the active involvement of farmers in the FAS structures at Zoba and sub-Zoba levels. At the village level, VCF and village representatives will be identified to assist in providing advice to farmers and other resource users on innovative approaches to CCA.

Linkages between research institutions and extension services will also be strengthened to engage with extension services, as well as having researchers participate regularly in extension work. Local communities will also play an active role in conducting research at the local level. For example, trials will be conducted on farmers' fields – as demonstration sites – instead of being limited to research institutions. The project will also encourage farmers and others trained in agricultural development to become more

involved in identifying research priorities. This approach will promote wider stakeholder involvement, which will take into consideration both traditional and scientific knowledge.

Indicative activities under Output 1.1.2 include:

- Establish a cross-sectoral committee/forum for dialogue between research institutions, relevant line ministries and extension services, including NARI, MOLWE and MoA within Zoba Debub and sub-Zoba Dbarwa's administration. The platform will be used to: i) share information about past, on-going and planned CCA and natural resource management interventions; ii) coordinate existing climate-smart agricultural practices, soil and water conservation measures; iii) improve the design and alignment of future CCA interventions, sustainable land use and management practices; iv) identify and address the barriers to scaling up successful interventions and approaches within Eritrea; and v) facilitate interactive dialogue with communities to discuss community needs and coordinate service delivery where relevant.
- Organise periodic capacity development and knowledge sharing sessions with staff, local institutions and farmers on effectiveness of CCA interventions, food security, IWRM and climate change, as well as mandate scholars and academics to: i) present study papers, research results and lessons learned; and ii) produce publications that inform policy- and decision-making processes ensuring that climate change is considered.
- Facilitate linkages with international organisations and access to research information by: i) subscribing to written and electronic bulletins published by international research institutions, as well as internet-based research portals; and ii) participating in or attending regional forums, workshops, research internships and exchange visits.
- Provide technical and financial support for the: i) strengthening of the existing information and communication unit at NARI; ii) revitalisation of the NFIS; and iii) re-establishment of FAS. Sub-activities will include:
  - Documentation and dissemination of information by the ICU will be achieved through: i) organising local-level awareness raising campaigns and training programs for farmers on lessons learned and best practices of CCA; ii) establishing a good practice database including traditional practices relevant to agriculture, livestock, water management and disaster risk reduction under climate change conditions; iii) promoting the establishment of model demonstrations at the NARI research centres by involving local communities to showcase relevant good practice examples on CCA and disaster risk reduction; iv) organising periodical capacity development and knowledge sharing sessions with staff, local institutions and farmers on effectiveness of CCA interventions; and v) disseminating tested good practices and lessons learned on CCA.
  - Establish strong linkages and partnerships under the FAS through: i) on-farm trials, field days and demonstrations, as well as participatory surveys; ii) regular meetings to review performance, identify problems, allocate roles and responsibilities, and plan and coordinate the uptake of technology; and iii) identification and selection of VCF and village representatives. The roles and responsibilities of VCF and village representatives are detailed below.
    - VCF will assist extension agents at sub-Zoba level to gather information and assess farmers' needs. They will: i) act as a liaison between extension agents and farmers; ii) assist with the establishment and management of demonstration plots for climate-smart agricultural technologies iii) participate in meetings and discussion groups; and iv) assist in obtaining climate-smart agricultural inputs.
    - Village representatives will assist VCF at Kebabi level to: i) gather information and assess farmers' needs under changing climatic conditions; ii) carry out field demonstrations of climate-smart agricultural technologies; iii) provide information and feedback to VCF on the effectiveness of climate-smart agricultural technologies; iv) routinely monitor and assess the performance of project activities implemented in villages; and v) forward information to extension agents at sub-Zoba level.

*Output 1.1.3: Technical and financial support provided to NARI (in association with other academic and research institutions) for conducting research and producing research reports on CSA and production systems, including but not limited to: i) drought resistant and early maturing crops; ii) sustainable water use and conservation practices; iii) conservation agriculture practices, including tillage management and soil fertility; iv) sustainable landscape management; and v) livestock production and grazing management.*

The LDCF-financed project will support NARI – through MOA, and in conjunction with other academic and research institutions – to undertake innovative and strategic climate-related agricultural research, which will improve climate risk management in Eritrea. The climate-related agricultural research will be supported by sector-specific research to understand the potential impacts of climate change and the effects thereof on agriculture, food security and IWRM. The research will also include investigations into technologies, methods for implementing climate-smart agriculture in the Eritrea context, and Tsilima region in particular. The research results will be used to provide knowledge-based advice to farmers and to inform the Ministry of Agriculture's support to the development of the agricultural sector, and through the extension advice institutions, relay some information to farmers and

other land users for uptake and adoption. The knowledge and information will also be disseminated through the network and information-sharing forum to be established under Output 1.1.2.

Indicative activities under Output 1.1.3 include:

- Develop local level research capacity through implementing research and training programmes relevant to CCA in the Tsilima Region together with academic and research institutions, including NARI, MoA and other international collaborators. These programmes will include local level resource tracking and M&E activities leading to adaptive management. Potential topics for climate-related agricultural research include:
  - Multidisciplinary research to determine the water balance and water requirement of crops. This will focus on the planning and development of irrigation projects, as well as sustainable agricultural water use and management methods and technologies.
  - Development of drought-resistant and short-maturing crops for rain-fed agriculture.
  - Conservation agriculture practices, including tillage management and soil fertility.
  - Watershed restoration.
  - Agroforestry and silvopasture.
  - Improved livestock productivity, rangeland development and grazing management. Post-harvest handling, storage and processing techniques and methods. Timber and non-timber forest products.
- Facilitate the production and publication of research reports in an accessible form, including as policy briefs.

*Output 1.1.4: Climate information and monitoring systems developed in association with relevant line ministries, departments – in particular, the Meteorological Services Unit – and local communities based upon data received from hydro-meteorological stations installed under Output 2.2.2.*

The LDCF-financed project will develop a national climate information and monitoring system which will monitor climate data and physical hazards to enhance the understanding of communities at risk. The capacity of hydro-meteorological services and networks to predict extreme weather events – such as floods and droughts – and associated risks will also be enhanced. The improved availability of information –through the establishment and refurbishment of hydrological and meteorological stations under Output 2.2 – will form the basis for future monitoring of the impacts of climate change. This will include observing, measuring, predicting or forecasting floods and droughts based upon the analysis of the data generated. Furthermore, the project will develop a more effective and targeted delivery of climate information including flood and drought early warnings in the Tsilima Region through the development of a community-based EWS.

Data from the national climate information and monitoring system will be collected by various stakeholders and analysed by the MSU, which is responsible for transmitting warnings to the local communities via the extension services, radio and other means of communication. The provision of seasonal forecasts and early warnings will allow farmers to make informed decisions based upon the data collected and analysed. These will include the location and selection of *inter alia*: i) climate-smart agricultural technologies and practices; ii) income-generating activities; and iii) climate- and ecosystem-smart watershed restoration measures.

Up-to-date climate change predictions will be incorporated into ongoing development planning in the relevant Kebabis of sub-Zoba Dbarwa to reduce the vulnerability of the local communities therein. Priority climate and related risks will be identified through a synthesis of community observations, traditional knowledge and scientific information – including the flood and drought prone area maps to be developed under Output 2.1.1. Subsequently, existing livelihood maps for sub-Zoba Dbarwa will be updated through a community-based planning exercise.

The project will pilot a community-based EWS in sub-Zoba Dbarwa at watershed level to strengthen the adaptive capacity of local communities to receive, analyse and act on warnings generated. Communities vulnerable to climate change and disasters will be identified and the EWS will track key variables at the village level, such as water availability, livestock condition, and fodder availability, incidents of conflict and health trends, including in particular malaria and dengue fever. The information generated through the EWS at village level will be shared with the relevant sectoral stakeholders, through the MSU and the cross-sectoral platforms to be established by the project and as part of the climate information and monitoring system. UNDP will work closely with the NUEW and the World Health Organisation to particularly monitor health-related information and the potential health-related impacts that may result from the project activities, in particular a potential increase in vector-borne diseases such as malaria and dengue fever that may result from increased availability of surface water (e.g. in dams). Based upon the information generated, activities will be developed to address priority needs and strengthen traditional coping mechanisms.

Indicative activities under Output 1.1.4 include:



- Develop and implement a capacity development program for the MSU to address gaps in skills, training, equipment and facilities.
- Provide training on meteorological observation and analysis to the MSU, other institutions and stakeholders involved in the collection and gathering of meteorological data. In particular, community members will be trained in household data collection.
- Provide technical and financial support to the MSU and other stakeholders to facilitate the establishment of a community-based EWS in sub-Zoba Dbarwa. This will include:
  - Initiating a community-based planning exercise to design an EWS, using a sustainable livelihoods approach to update and expand existing livelihoods maps for sub-Zoba Dbarwa and to clarify priority climate and related risks.
  - Collate and synthesise community observations, traditional knowledge and scientific information – including the flood and drought prone area maps to be developed under Output 2.2 – on climate risks and the impacts thereof on livelihoods.

**Outcome 1.2: Capacity of extension service institutions to provide knowledge-based climate-smart extension services to agriculture, livestock production and water management increased.**

*Output 1.2.1: Capacity and resource needs assessment, development and training programmes implemented within institutions involved in extension services on inter alia sustainable land, forestry and water resources management.*

A rapid capacity assessment was conducted for the Agricultural Extension Department of the Ministry of Agriculture (see Annex K) and it indicated little to no capacity for provision of climate-smart advice (the average score is 1 - No evidence of capacity). Significant investments therefore need to be made to get this department to be able to fully deliver on its mandate. A more comprehensive assessment of the gaps in capacity will be conducted and a response strategy put in place. The LDCF-financed project will address aspects of the identified capacity gaps through providing technical support to extension officers at the Zoba and sub-Zoba level for coordination and supervision of the project's CCA interventions. Based on the outcome of the capacity and resource needs assessment that will be conducted, a capacity building program will be developed targeting sub-Zoba level subject matter specialists – particularly staff in the Agriculture and Land Division. Existing training protocols and programmes will be updated based upon the needs assessment and international best practices related to CCA. The training and capacity-building activities will include long-term climate change projections in the design, implementation and maintenance of CCA interventions. Various innovative and climate-smart approaches for the design and implementation of both ecological and agricultural interventions will also be included in the training. Furthermore, technical assistance will be provided for in-service and on the job training for staff at both Zoba and sub-Zoba level.

Indicative activities under Output 1.2.1 include:

- Conduct a comprehensive needs assessment for CCA training. This will be initiated and coordinated by MOLWE and MoA. The needs assessment will include: i) a stock-taking exercise to identify existing training materials on CCA in Eritrea; and ii) an assessment of the types of training required to build Zoba and sub-Zoba capacities.
- Provide financial and technical support including equipment and facilities identified as limited within the capacity and resources assessment. Examples of equipment that may be required include computers and associated software, audio-visual equipment, GPS equipment, topographic survey equipment and software. The technical support will include enhanced internet connectivity and communications, which will promote e-learning, access to knowledge and information sharing.

*Output 1.2.2: Extension packages reviewed and updated to include best practices and other relevant materials through the provision of technical and financial support at national, Zoba, sub-Zoba and Kebebi levels.*

The LDCF-financed project will assist the GoSE to review and update extension packages, as well as refine strategies and policies for technology dissemination. All updates to the extension packages will ensure that the integration of technologies, such as CSA, will be sustainable and within the resource constraints of government, as well as respond to the needs of smallholders and vulnerable communities. The revised extension packages will be facilitated by the development of Farmer Advisory Services under Output 1.1.2, which will promote an integrated crop and livestock service and introduce use of contact farmers to alleviate pressure upon extension agents.

Extension agents will receive training on up-to-date methods for natural resource management focusing on agricultural and ecological interventions. The agricultural interventions will include: i) climate-smart agricultural and livestock production; ii) integrated crop-livestock production systems; iii) conservation agriculture; iv) agroforestry; and v) sustainable water use and

management including irrigation technologies. The ecological interventions will include: i) soil and water conservation; ii) rangeland management; and iii) watershed restoration. Training will also be provided to extension agents, as well as relevant stakeholders who will be involved in the implementation of the project on CCA. The Agricultural and Land Division's capacity to disseminate and implement improved technologies – integrating climate risks and sustainable water resources management – will also be enhanced through on-the-job training.

Indicative activities under Output 1.2.2 include:

- Review and update the extension services package to include aspects that are not covered within the current portfolio and pilot the revised extension services package in sub-Zoba Dbarwa. The extension services packages will be tailored to the local context with respect to: i) types of extreme weather events; ii) prevailing socio-economic conditions; iii) environmental considerations; and iv) the needs of local communities.
- Train extension agents on the revised extension packages, which will support the transition towards CSA and establish an effective working link with farmers.
- Develop a strategy to build technical capacity of MoA's Agricultural Extension Department to enable development and transfer of climate-smart agricultural technologies and livestock production practices.
- Develop manuals and leaflets as reference materials and guidelines on climate- and ecosystem-smart agricultural and ecological interventions, as well as methods for monitoring the effectiveness thereof. These documents will be produced on an annual basis and distributed amongst extension agents.

*Output 1.2.3: A long-term strategy developed and implemented for monitoring and evaluating climate-smart: i) water resources use and management; ii) agricultural practices; and iii) livestock productivity.*

Participatory monitoring and evaluation (M&E) of the implementation of climate-resilient land use and area development plans – to be developed under Outcome 2.1 – is integral to the success of the project and continued learning and uptake of best practices that the project will generate. A cost-benefit analysis of the agricultural and ecological interventions will be undertaken to measure the impacts and analyse the effectiveness of such interventions. Training will be provided to community members on low-cost, user-friendly biophysical indicators and rural appraisal tools to measure the impacts of project interventions, including use of water resources, as well as the effectiveness of improved agricultural and livestock practices.

Indicative activities under Output 1.2.3 include:

- Develop an M&E methodology in selected areas taking into consideration biophysical and socio-economic indicators and develop performance targets for project interventions.
- Train the community members, extension agents, NARI technical staff on the M&E methods and techniques, as well as indicators.
- Document processes, implement M&E methodology and synthesise lessons learned and best practices to inform local level land-use planning and the up scaling of CCA interventions.
- 

**Component Two: Climate-resilient land-use planning to support the adoption of climate-smart agricultural and ecological interventions.**

Total Cost: USD\$ 9,105,000

LDCF project grant requested: \$ 7,055,000; Co-financing (UNDP):\$ 2,050,000

Without LDCF intervention (baseline):

Land within the Tsilima Region – as in any other part of Eritrea – is owned by the state and is subject to the *diessa* land-tenure system. By transferring user rights every five to seven years – the *diessa* system serves as a disincentive for farmers to make long-term investments on their land. Soil and water conservation measures needed to rehabilitate land, prevent soil erosion or to build up and maintain soil fertility are not fully being implemented by farmers. To reverse this situation and to promote or assure initiative and motivation among beneficiaries and producers, the government has embarked on addressing the problem by gradually implementing the 1994 Land Proclamation – which provides security of tenure. However, this effort is challenged by a shortage of qualified staff, mapping equipment and software – including GPS and GIS – to undertake scientific classification and mapping of individual parcels for land use and redistribution. Land reform is also not without complexity and is politically challenging. For this reason, the government is taking extra caution in the implementation of the reforms, with significant delays, and in some cases halting of the process. Current land use planning and development at Zoba and sub-Zoba level does not adequately integrate climate change considerations. The redistribution of land and long-term investments in agricultural land will therefore subsequently be implemented without the benefit of appropriate climate-related information. For example, soil and water conservation measures are

implemented without an understanding of the impacts of climate change on the productivity of plants and soil or the impact of such measures on ecosystems themselves. The agricultural productivity of land and the effectiveness of soil and water conservation measures may therefore be undermined by the predicted effects of climate change, especially an increase in droughts and floods.

The availability of water, or lack thereof, constrains the agricultural productivity of land in the Tsilima Region. Groundwater is the most dependable source of water in Eritrea. However, despite sufficient WRD regulations, digging and drilling of wells is often unregulated due to inadequate enforcement and the continuous pumping of water from these sources has led to a decline in water levels as observed in the Tsilima Plains and upper catchment area. The Water Resources Department (WRD) is responsible for undertaking a comprehensive national water resources assessment and monitoring for efficient, effective and sustainable use and management thereof. However, this department requires capacity building both in terms of human resources and equipment to enable it to discharge its mandate effectively. The inadequate human resources and existing spatial and non-spatial information systems have hampered adequate assessments of water resources, data management and data exchange. As a result, the proper planning, development and sustainable management of Eritrea's water resources is not taking place.

Inadequate knowledge regarding flood discharges and the sediment concentrations of flows undermines the effectiveness of current ecological interventions – particularly diversion structures and flood control measures. Consequently, diversion structures have been regularly breached and canal networks blocked with sediment deposits. These deposits reduce the amount of water that can be diverted and the overflow contributes to surface flow and subsequently soil erosion. In addition, the dimensions of earth embankments and bunds are insufficient for the retention of increased surface water. The predicted increase in frequency and intensity of rainfall events under climate change conditions will therefore undermine the effectiveness of these structures.

With LDCF intervention (adaptation alternative):

The LDCF-financed project will undertake climate-resilient land use planning over 9,000 hectares of land in the Tsilima Region including the development of community-based land use and area development plans under Outcome 2.1. These plans will facilitate the adoption of locally appropriate agricultural and ecological interventions that will contribute to climate proofing investments by the Food Security Strategy and IWRM action plan in the agriculture and water sectors. The envisaged interventions will include *inter alia*: i) physical infrastructure to optimize the ability of riverbanks and beds to increase infiltration and for harvesting excess water during flash floods; and ii) adoption of climate smart-agricultural and livestock production practices under Outcomes 2.2 and 2.3.

Under this outcome, the project will support the efforts of the IWRM Action Plan to improve the water resources information database. Water monitoring and the efficient use of available water will be of fundamental importance to the implementation of CCA interventions, including the development of climate-smart agricultural technologies. The efficient, equitable and sustainable management of water resources is generally only possible at the watershed level combined with farm/household level management practices. Under Outcome 2.2, the project will support the implementation of ecological interventions through a watershed restoration programme covering over 9,000 hectares within the Tsilima Region. The ecological interventions will be aligned with the community-based land-use and area development plans and will reduce watershed degradation through the implementation of *inter alia* reforestation and on-farm and off-farm soil and water conservation measures. Ground water recharge will be enhanced through the: i) development of water harvesting and storing structures – such as flood control and water spreading facilities – along the river system; and ii) construction of sub-surface dams. Furthermore, the development and implementation of supplementary irrigation schemes will improve agricultural productivity. The ecological interventions will entail simple, farmer-friendly structures – such as earth embankments and furrows – using locally available materials. Such structures are easy to construct and can be operated and maintained by newly established or strengthened CBOs, including water user groups.

Under Outcome 2.3, the project will increase food security through the implementation of agricultural interventions that are climate-smart. In addition, the project will provide support to the diversification of livelihoods by identifying and supporting alternative income-generating activities. The extension services – capacitated under Component 1 – will support the development and transfer to farmers of a range of CSA and livestock production practices, as well as alternative income-generating activities, including: i) drought and disease-resistant varieties; ii) integrated crop-livestock production systems; iii) conservation agriculture; iv) agroforestry; and v) rangeland management focusing on conserving native fodder and crop species and varieties, enabling them to be used by small-scale farmers.

The project will implement agricultural interventions including CSA at the local level through effective and innovative climate-resilient land use planning. These interventions will enable local communities to: i) build on their traditional natural resource management knowledge; ii) increase their understanding of the impacts of climate change on their livelihoods and natural resources; iii) address the effects of climate change through the development and adoption of *inter alia* locally appropriate CSA practices; and iv) prepare their own land use and area development plans.

Intensive training will be provided to Kebabi administrators and local communities throughout the implementation of the project, focusing on the: i) adoption of agricultural and ecological interventions at the watershed-level; ii) the ecological benefits of such interventions for the upper as well as lower catchment and Tsilima Plain; iii) socio-economic benefits to residents of the Tsilima Region; and iv) community-based land use planning and development.

**Outcome 2.1: Climate-resilient land use planning implemented over 9,000 hectares of the Tsilima Region.**

*Output 2.1.1: Based on the assessments undertaken in Output 2.2.1: i) identify and map drought and flood prone areas; and ii) develop and implement community-based land use and area development plans in the Tsilima Region.*

The LDCF-financed project will support climate-resilient land-use planning with the benefit of improved hydro-meteorological information – collected and monitored under Output 2.2.1 and vulnerability and risk assessments conducted at community levels. Under this output, the project will assist in the development of community-based land use and area development plans for each of the Kebabi Administration Areas (KAA) within the project area. Climate-risk information and vulnerability and risk perception will inform decision-making on land-use planning and climate-smart agricultural practices. In addition, the hydro-meteorological information and groundwater assessments to be conducted under Outcome 2.2 will support the mapping of current and projected drought and flood prone areas, and potential shifts in these, in order to better inform planning. At a socio-economic level, a Vulnerability and Risk Assessment (VRA) will be conducted to gauge both awareness of climate change impacts, as well as the perceptions of communities and land users about their vulnerability towards the risks imposed by climate change and variability.

Based upon the information and maps generated through water assessments (Output 2.2.1), land capability and soil surveys (Output 2.1.4), as well as vulnerability and risk assessments, community-based land use and area development plans will be developed for each of the KAA. To ensure that the watershed is properly utilised and managed, the project will facilitate a participatory decision-making process and continual dialogue between villages. Furthermore, because many farmers are illiterate, the use of visual tools such as community maps and photographs is recommended to encourage community participation in drafting the plans.

Indicative activities under Output 2.1.1 include:

- Generate maps identifying flood and drought prone areas under climate change conditions which pose a threat to the livelihoods of local communities in the KAA – based upon the improved hydrological and meteorological data and assessments under Outcome 2.2.
- Conduct a comprehensive Vulnerability and Risk Assessment as per the guidance and methodology indicated in Annex P (A Guide to the Vulnerability Reduction Assessment)<sup>7</sup>.
- Provide technical and financial support to undertake land capability classification, including a soil survey and soil chemical analyses.
- Engage with sub-Zoba administration, KAA, extension agents and local communities to assist communities in the development of climate-resilient land use and area development plans.

*Output 2.1.2: Existing CBOs strengthened, including inter alia VACs, Water User Associations and Farmer Associations to coordinate local level participation in climate change adaptation, land use and development planning.*

The LDCF-financed project will facilitate the establishment or strengthening of CBOs, which will be actively involved in climate-resilient land use planning. A bottom-up approach is necessary to ensure local stakeholders support CCA interventions, are accountable for the results and receive tangible benefits. Technical and financial assistance will be provided to CBOs, including VACs, Water User Associations and Farmers Associations to improve their technical capacities for natural resource management.

The strengthening of local institutions will include the sharing of experiences, innovations and knowledge among farmers and enhancing farmer-to-farmer extension. A discussion forum will be developed to allow communities to come together to plan and negotiate agricultural and ecological interventions suitable to the local context at a broader scale – watershed level. Furthermore, this process will ensure that the activities of adjacent communities do not have an adverse effect upon other communities' natural

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<sup>7</sup> Andrew Crane Drosch, Nickey //Gaseb, Pradeep Kurukulasuriya, Andre Mershon, Katiella Mai Moussa, Dale Rankine, Alejandro Santos (2008) **A Guide to the Vulnerability Reduction Assessment: UNDP Working Paper. UNDP Community-Based Adaptation Programme.** GEF6 CEO Endorsement /Approval Template-Sept2015

resources, including land, forestry and water resources. An integrated approach to natural resources management under conditions of climate change will therefore be adopted by the local communities at the watershed level.

Indicative activities under Output 2.1.2 include:

- Provide financial and technical support for the strengthening/establishment of CBOs including VAC, Water User Associations, Farmers Associations and Land Use Committees at local level.
- Review existing policy and institutional framework and implement community by-laws for sustainable land, forestry and water resources management.
- Hold training workshops including exchange experiences and meetings wherein stakeholders will be able to exchange ideas and discuss common problems.
- Create a forum for discussions between CBOs of neighbouring KAA.

*Output 2.1.3: Technical support provided to the Zoba and sub-Zoba administration to inform implementation of the land redistribution process through the: i) classification of land according to potential land uses; ii) mapping of coordinates; and iii) assessment of the availability and quality of resources (e.g. soil and water).*

The LDCF-financed project will provide institutional and technical support to Zoba and sub-Zoba administrations for climate-resilient land-use planning. The project will also provide financial support to assess the state of land, forest and other natural resources and quantify the impacts of climate change on these resources and the communities dependent on them in the Tsilima Region. A thorough understanding of the current pressures and constraints on the natural resources within the project area will inform the formulation of land-use and area development plans (under Output 2.1.1). Under this output, the project will also provide assistance to the mapping of land and natural resources, as well as the identification of parcels of land for different uses in accordance with the findings of the assessment. This support is designed to facilitate informed decision-making about land allocations under the Land Proclamation of 1994 whose objective is to redistribute/allocate permanent land parcels to citizens and replace the current diessa system, and therefore increase land tenure security for households. Land allocation decisions are meant to be based on resource quality and availability, in particular soil and water. Traditionally redistribution and allocation of land is usually carried out by a committee of village elders elected by the village (baito). These committees generally apply traditional soil classification schemes to categorize available arable land into different groups (Subuh-fertile; Maekelai-medium; and Rekik-marginal/unfertile).

The new land policy (1994 Land Proclamation) is aimed at eliminating periodic redistribution, curtailing land disputes, increasing duration of the land rights and enhancing exclusivity and transferability rights. These measures are meant to provide land cultivators with more secure land rights, which ultimately will contribute in boosting long-term investment, improved land husbandry and better environmental conservation. This new land law will permit the classification and allocation of land on a more rational and scientific basis, avoiding fragmentation, and ensuring the establishment of appropriately-sized reserves for woodlots, grazing, and communal, housing and urban facilities. The mapping and resource assessments to be conducted under the project will therefore contribute to informing the land allocation process by providing scientific data on location of resources (e.g. groundwater, forests) and their quality.

Indicative activities under Output 2.1.3 include:

- Assess availability and quality of resources through inter alia land capability classifications and soil surveys.
- Identify and classify individual parcels of land according to results of assessments.
- Undertake GIS mapping and plot coordinates for the demarcation of land uses.
- Hold training workshops for extension agents and subject matter specialists on GIS skills, land surveying and classification of land for climate-resilient land use planning.

## **Outcome 2.2: Integrated water management operationalised across the Tsilima Region, increasing water availability and land under irrigation.**

*Output 2.2.1: Groundwater and surface water resources assessment undertaken and a groundwater monitoring strategy (including a system of data collection and information exchange on water use and projected demand) developed and implemented in the Upper Mereb catchment.*

Under this outcome, the LDCF-financed project will support the WRD in undertaking comprehensive baseline assessments and monitoring of water resources. Rates of surface and ground water abstraction are currently not informed by scientific data on rates of replenishment, contributing to over-abstraction and the depletion of groundwater resources in Eritrea, particularly in the GEF6 CEO Endorsement /Approval Template-Sept2015

highlands. The project will improve: i) the knowledge base on water resources; ii) understanding of the existing and projected demands for water; and iii) the capacity of water management institutions to manage ground- and surface water resources. Information generated by the baseline assessment and ongoing monitoring will inform the management of watersheds, as well as the design of measures for the capture, storage and distribution of water. The project's activities will subsequently increase the returns on irrigation investments financed through the food security programme implemented under the auspices of the Food Security Strategy.

Indicative activities under Output 2.2.1 include:

- Undertake a groundwater and surface water resources assessment and develop a groundwater inventory. This will include an assessment of the current and projected water demands for all land uses and purposes such as agriculture, domestic and livestock.
- Develop comprehensive water development and management plans based upon the ground and surface water resources assessment.
- Purchase and installation of groundwater monitoring and stream gauge equipment, including at least one automatic stream flow and four staff gauges with sediment sampling programme to monitor the flow and sediment loads of the major streams draining the project areas. The installation will include the drilling of groundwater monitoring wells.
- Establish and implement a groundwater monitoring strategy for the upper Mereb catchment and facilitate dissemination of data to WRD, relevant decision-makers and local communities.
- Review IWRM Action Plan to incorporate responses to climate change impacts on the water sector.
- Provide technical support to strengthen WRD's water resources information database and management system. This will include basic data collection, as well as processing, analysing and disseminating information.
- Develop water management tools and guidelines for dissemination by WRD to decision-makers and local communities.
- Provide training to WRD on the assessment and monitoring of groundwater resources and adaptive management of the water sector in the face of a changing climate.

*Output 2.2.2: Hydro-meteorological stations established and/or refurbished at Mendefera, Dbarwa and Halhale.*

Under this output, the LDCF-financed project will facilitate the refurbishment and establishment of hydro-meteorological stations to enable the gathering of climate information – including precipitation and temperature – and monitoring of seasonal and inter-annual variations in climate. In particular, data on rainfall magnitude and spatial distribution will be collected to underpin the monitoring and forecasting of droughts and floods. Stream flow and run-off estimates will be informed by the installation of stream gauge stations. The data will be collected on a regular basis by trained members of the local communities, extension agents and relevant institutions. It will be recorded and transmitted to the MSU and WRD, who will analyse the data and disseminate early warnings and climate forecasts to NARI, MOLWE and MoA under Outcome 1.1. The information provided will enable decision-makers to: i) predict when a drought or flood may occur and the intensity thereof; and ii) inform land-use planning and the cropping decisions for the next season. By providing information on water availability, local communities will be able to improve their water-use efficiency and manage their reservoirs and water supplies more effectively.

Indicative activities under Output 2.2.2 include:

- Purchase and installation of new hydro-meteorological stations including: i) a Class 1 meteorological station at Mendefera; and ii) three Class 3 meteorological stations within the upper catchment.
- Refurbish the existing Class 1 meteorological station at Halhale research station.
- Establish an appropriate communication system to transmit: i) hydro-meteorological information to the MSU; and ii) transfer early warnings from the MSU to relevant Kebabi administration within sub-Zoba Dbarwa, including on weather forecasts and predictions as well as seasonal forecasts that will be useful for informing preparedness for outbreaks of floods and droughts as well as the incidences of vector-borne diseases such as malaria and dengue fever, which is now on the rise in the Eritrean highlands.
- Provide training for technical staff from NARI, extension agents and other relevant institutions, as well as selected community members on data collection and record keeping.
- Provide training to MSU on the interpretation of climate information and translation into locally relevant climate forecasts and early warnings.
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*Output 2.2.3: Climate-smart watershed restoration and management measures identified and implemented, including: i) water harvesting and storing interventions; ii) flood diversion and water spreading facilities; and iii) on-farm and off-farm soil and water conservation measures.*

Under this output, the LDCF-financed project will implement restoration measures to ensure the recovery and improved functioning of degraded watersheds under future climate change conditions. The implementation of CCA interventions at the watershed level will reduce soil erosion, increase soil fertility and regulate water flow during flash floods. Such interventions will mitigate the damaging effects of droughts and floods. In addition, watershed restoration and river bank treatments will increase groundwater recharge and the amount of water available for irrigation. The restoration of degraded watersheds will be supported through the provision of materials and equipment necessary for implementing flood control, water storage and runoff reduction measures.

The list of potential watershed restoration and management measures to be implemented will be developed with explicit consideration of the local socio-economic and environmental context. Criteria that will be considered in the design of the interventions will include *inter alia*: i) demonstrable effects in reducing the risk of droughts and floods; ii) clear, viable and sustainable benefits to local communities; iii) cost effectiveness; and iv) minimal maintenance requirements. The design will also consider the likely increase in frequency and severity of droughts and floods under climate change. For example, the size of diversion weirs, intake facilities and conveyance canals as well as the height and width of earth embankments will be designed in accordance with the 50-100 year flood levels. In addition, these measures may include sediment-excluding facilities to handle the potential increase in debris as a result of climate change.

Natural regeneration activities – particularly enrichment planting to introduce valuable species to degraded areas – will be implemented on agricultural lands and rangelands. These activities will be informed by: i) the predicted effects of climate change; ii) the capacity of species to maintain provision of ecosystem goods and services under climate change conditions, such as species that are drought- or flood-resilient; and iii) community needs and preferences. Examples include: i) species that produce non-timber forest products such as fruit, fibre and fodder; ii) fast-growing species for firewood; and iii) species that promote the growth of other vegetation. Species with multiple benefits will be prioritised in order to establish an ecosystem that is both climate-resilient and provides additional livelihood benefits. The project will propagate local agroforestry species including *Faidherbia albida*, *Rhamnus prinoides* (Gesho), *Opuntia ficus-indica* (Cactus pear), *Moringa oleifera*, *Leucaena leucocephala* (Licina), *Acacia mearnsii* and *Senegalia polyacantha*. Sites for implementing agroforestry will be identified based upon consultations with local communities with a focus on villages with: i) small farmlands; ii) small grazing lands; and iii) a large number of women headed households. During the PPG phase, the following KAAs were identified as likely places suitable for implementation within the Tsilima Plain: i) Adi Geda; ii) Adi Bazehannes; iii) Amadir; iv) Teraemni; v) Temajilan; vi) Adbzage; and vii) Adi logo. KAAs identified within the upper catchment area include: i) Gerteti; ii) Kisad Daero; iii) Adiketekula; iv) Dektusnea; and v) Zawle.

Indicative activities under Output 2.2.3 include:

- Provide financial and technical support to WRD to develop and pilot integrated water management practices within the Tsilima Region. This will include the following sub-activities.
  - Undertaking site investigations and hydrological analysis of potential locations for the implementation of integrated water management, soil and water conservation measures. This will include undertaking comprehensive EIAs for the construction of soil and water conservation measures, particularly sub-surface dams.
  - Implementing approximately six water diversion schemes over 240 hectares of land in the upper catchments of Halhale, Mereb and Mao Megoso rivers.
  - Harvesting floodwater to enable irrigation of ~60 hectares of rain-fed cereal production and rangelands in selected KAA.
  - Constructing two sub-surface dams which are able to retain ~600 000 m<sup>3</sup> of water. The exact location of these dams will be determined following comprehensive surface water assessments and completion of the water development plans. Preliminary assessments indicate the following locations: i) Adi Bezehaness; ii) Adi Harbo in Amadir KAA; and iii) Adi Bana in Kisad Dearo KAA.
- Promote rainwater harvesting by treating land surfaces to decrease infiltration and make runoff available for irrigation and other uses. The runoff will be stored in a reservoir to supply water in small fields, whilst ditches will be used to harvest rainwater from hillsides or gentle slopes where the soil permeability is slow.
- Develop and implement soil and water conservation measures over 9,000 hectares of land within the Tsilima Region, including *inter alia*: i) hillside terracing; ii) establishing 300 hectares of new enclosure areas and maintaining 200 existing permanent and seasonal enclosures; iii) planting of 1.4 million indigenous and multi-purpose trees over an area covering 1,200 hectares of degraded land in the western mountain ranges of the upper catchment area; and iv) incorporation of multi-purpose trees in household woodlots and community enclosures.
- Promote natural regeneration and reforestation of degraded watersheds through, *inter alia*: i) promoting agroforestry by planting ~35,000 seedlings on 600 hectares of farmland – 450 hectares in the Tsilima Plain and 150 hectares in the upper catchment area; ii) using a mix of drought-resistant indigenous and fast growing exotic species in community forestry initiatives; iii) expanding enclosure areas; and iv) promoting enrichment planting and indigenous plants to fill gaps.

- Establish and/or upgrade existing forestry nursery sites within sub-Zoba Dbarwa and NARI. These nurseries will produce a variety of tree seedlings – including multi-purpose trees – for planting in enclosures, farms, backyards and roadsides of villages.
- Engage with local communities in the planning and design of: i) water harvesting and storing interventions; ii) flood diversion and water spreading facilities; and iii) on-farm and off-farm soil and water conservation measures.
- Output 2.2.4: Local communities and households trained to undertake sustainable water use and management, including *inter alia* water harvesting, construction and maintenance of hard and soft engineering interventions.

The LDCF-financed project will provide training to technical staff, extension agents and local communities on the implementation of sustainable water-use and management interventions. The training will be based upon the findings of the groundwater and surface water resources assessment (under Output 2.2.1) and the climate-related research (under Output 1.1.3). In addition, the training will cover the construction, operation and maintenance of hard and soft engineering interventions that will be implemented in targeted communities under Output 2.2.3. These will include flood control, water harvesting and water storage interventions.

Indicative activities under Output 2.2.4 include:

- Provide training to technical staff from the WRD and MoA – at Zoba and sub-Zoba levels on adaptation techniques and approaches that are specific to water management, including: i) cultivation of crop varieties with increased resistance to extreme conditions; ii) irrigation techniques that maximise water use; iii) adoption of supplementary irrigation in rain-fed systems and water-efficient technologies to harvest water; iv) the modification of cropping calendars; and v) the efficient use and management of water resources for irrigation.
- Hold training workshops for local communities, including farmer-farmer exchanges and visits to demonstration plots on the construction, operation and maintenance of watershed restoration measures and technologies.
- Develop manuals on operation and maintenance of hard and soft engineering interventions, including flood control measures, water harvesting interventions, and soil and water conservation measures.

### **Outcome 2.3: Increased food production through the implementation of climate-smart agricultural practices across the Tsilima Region.**

*Output 2.3.1: Climate-smart agricultural practices – informed by research products generated under Output 1.1.3 and land use and area development plans prepared under Output 2.1.1 – developed and transferred to farmers, including :i) drought- and disease-resistant varieties; ii) integrated crop-livestock production systems; iii) conservation agriculture; iv) agroforestry; v) silvopasture; and vi) rangeland and livestock management.*

The LDCF-financed project will implement CSA practices in the Tsilima Region based on both traditional and scientific knowledge. CSA best practices – such as mulching, intercropping with drought and flood-tolerant crops, crop rotation and changing planting schedules – will be adopted to improve agricultural productivity under current and future climate conditions. Furthermore, the dissemination of drought-resistant livestock and appropriate livestock management techniques will complement the environmental and economic benefits of the soil and water conservation measures implemented under Output 2.2.3.

Agricultural productivity will be enhanced by planting of trees and shrubs that will increase soil moisture and soil organic matter while also diminishing the effects of heavy rains, droughts and wind storms under climate change conditions. By incorporating fodder trees within crop fields, the project will increase the availability of fodder for livestock and reduce the dependence on degraded rangelands. Economically important shrubs such as *Rhamnus prinoides* (Gesho) and legume trees with pods will also be grown. Such species include *Acacia senegal*, *Vachellia tortilis* and *Faidherbia albida*. The promotion of agroforestry within productive agricultural systems will: i) increase food security; ii) reduce the agricultural sector's vulnerability to climate change; and iii) increase the adaptive capacity of local communities in the Tsilima Region to climate change.

The LDCF-financed project will also provide training to local communities on the implementation of climate-smart agricultural technologies and livestock production practices. A participatory approach to training will be adopted, facilitating learning through *inter alia* organising farmer-farmer exchange visits, as well as visits to demonstration plots (which will be established under Output 2.3.1).

Indicative activities under Output 2.3.1 include:

- Identify and implement a range of climate-smart agricultural technologies and methods within and around pilot communities. This will include *inter alia*: i) planting faster maturing, drought- and disease-resistant tree species; ii)



promoting integrated crop and livestock productivity systems; iii) promoting conservation agriculture; iv) promoting agroforestry; v) adopting improved rangeland management practices over 1,250 hectares of grazing land – including 720 hectares in the upper catchment area and 275 hectares in the lower catchment area; vi) promoting the conservation of native fodder and crop species; vii) introducing tree-planting campaigns; and viii) promoting rotational grazing, cut and carry, and reseeding of grasses to promote rangeland productivity.

- Establish demonstration plots at each of the project intervention sites to demonstrate climate-smart agricultural technologies and methods. Organise experience-sharing events where farmers and community members from nearby villages are brought to the demonstration plots.
- Train extension agents and CBOs to oversee and coordinate local community involvement in the implementation of CCA interventions and climate-smart agricultural technologies and livestock production practices.
- Train local communities on the implementation and maintenance of CSA technologies and livestock production practices.

*Output 2.3.2: Alternative income-generating livelihoods identified and implemented in pilot communities.*

Support under this output will build on existing government programmes being implemented by the Ministry of Agriculture to promote livelihood diversification among households in Eritrea, including the Tsilima region. The agricultural support packages provided by the government are to promote income-generation as well as food security and improved nutrition. They include:

- **Dairy-cattle for milk production** – To promote access to milk and milk products, both nationally and community and household levels, the MoA is supporting selected farmers to integrate dairy production into their livestock production systems. These farmers are also encouraged and supported to produce their own forage for feeding their cattle. Technical support is also provided by the government on improved dairy cattle management and cattle health management.
- **Small-stock production** – The MoA also supports the production of goats and sheep for meat and other products, and as an income-generation opportunity for households. Small stock is particularly viewed as a quick way to earn cash income. Women and women-headed households are particularly targeted as beneficiaries of small-stock agricultural packages. This is largely to support income generation and livelihood diversification opportunities, but to also promote access to meat protein and other meat products.
- **Poultry production** – The MoA also has a scheme through which it distributes chicks to households, mostly women-headed. The poultry has benefited a significant number of households in the Tsilima region. Through this scheme, egg and poultry meat production have become important income generation activities, and have also increased household food security and improved nutrition.
- **Bee-keeping for honey production** – Honey production in Eritrea is one of the popular livelihood activities in Eritrea. It is seen in the highlands of the country as one of the most low cost investment income-generating activities for resource-poor farmers including women, youth and the unemployed sectors of the community. The Tsilima region is regarded as suitable for honey production. It is a highly valued agricultural product and for this reason, the MoA is supporting farmers by supplying apiculture equipment/facilities such as improved beehives, honey processing gears.

Through the LDCF project, and in collaboration with the MoA, support to these agricultural packages, as well as additional off-farm income generating opportunities will be identified for creating off-farm employment and diversifying traditional livelihood practices based upon the climate-related research undertaken in Output 1.1.3. Particular focus will be paid towards the processing of agricultural products and development of improved agricultural value chains. Products such as honey have a potential to access international markets if properly produced, processed, packaged and marketed. The project will therefore identify potential income-generating activities and investigate the conditions necessary for effective local-level adoption, profitability and sustainability. Emphasis will be placed on activities suitable for adoption by women and female-headed households who are among the most vulnerable to climate change. The project will also promote integrated crop and livestock production in line with the approach of promoting landscape and ecosystem resilience which in turn will promote resilience of the agricultural sector and that of farming households and communities.

Indicative activities under Output 2.3.2 include:

- Provide technical and financial support for the identification and implementation of selected income-generating activities in addition to the ones supported by the government. Such activities will include the creation of opportunities for off-farm employment through the: i) expansion of irrigated agriculture, dairy and poultry farming; and apiculture; ii) introduction of multipurpose tree species into households tree plots such as *Rhamnus prinoides* (Gesho), acacia and other fruit trees; iii) promotion of beekeeping; and iv) promotion of small stock.

- Training of community members on value-addition activities, including agro-processing and marketing skills.
- Support for access to markets within and outside the Tsilima region.

### **Component Three: Knowledge management and awareness-raising**

Total Cost: USD\$ 250,000

LDCF project grant requested: \$ 200,000; Co-financing (UNDP):\$ 50,000

#### Without LDCF intervention (baseline):

The NCSA recognises that the GoSE has insufficient capacity within relevant line ministries and academic institutions to: i) promote the use of national and global information on climate change research; and ii) develop and implement climate change education, training and public awareness campaigns. Modern database management facilities and skilled human resources to develop and maintain databases are limited in the institutions responsible for CCA and natural resource management. Consequently, there is limited availability of baseline data and little sharing of such information within Eritrea.

There is a low level of understanding within local communities regarding the predicted impacts of climate change in Eritrea and potential benefits of CCA interventions in reducing those negative impacts. The scarcity of awareness materials and poor integration of environmental matters into formal education programs and curricula limits public understanding of the dynamics shaping ecosystems and results in weak responses to environmental challenges affecting people and their livelihoods. This is exacerbated by widespread illiteracy among farmers, making it difficult to disseminate useful information to rural communities using conventional information, education and communication materials.

There is limited generation and systematic sharing of knowledge on CCA and natural resource management, which can inform community livelihood practices. For example, the impacts of unsustainable land-use practices are not well understood by farmers. As a result, these unsustainable practices continue, posing further threats to the resilience of ecosystems and their ability to continue to provide goods and services to society. This further decreases the resilience of communities' livelihoods against the impacts of climate change. Currently, there are no communication or outreach strategies providing information to stakeholders such as extension agents and farmers. Insufficient information and public awareness are major challenges affecting the integration of climate change considerations into planning processes at the national and local levels. As a result, CCA is not adequately integrated into new and existing national policies and strategies, nor are the potential benefits of adopting sustainable measures appreciated by government and local communities.

Knowledge and awareness of CCA and the associated benefits of building the resilience of communities and ecosystems –thereby improving communities' livelihoods – is likely to remain limited if information on CCA interventions is not shared at all levels. Furthermore, the capacity of national and local authorities to facilitate the implementation of such interventions will remain low. This will limit the replication and upscaling of CCA interventions– such as those demonstrated through this project – in other Zobas in Eritrea.

#### With LDCF intervention (adaptation alternative):

Knowledge and information exchange and joint learning is integral to the successful development, implementation and scaling up of CCA interventions throughout Eritrea. The LDCF-financed project will promote systematic knowledge sharing among all stakeholders. This will entail promoting education and awareness for mainstreaming climate change considerations at both the national and local levels. By doing so, the project will contribute towards an informed and knowledgeable public and this will further facilitate the creation and skills to systematically address the impacts of climate change at all levels of society and economy. Support for the implementation of project activities will be generated through public awareness-raising campaigns on the benefits of implementing CCA interventions. These campaigns will rely upon various media including print and radio productions, public fora/meetings to disseminate information to the public.

The project will adopt a versatile approach to disseminate knowledge of climate-smart agricultural practices and climate-resilient land-use planning. Under Output 3.1, the project will support the packaging of knowledge and information using locally appropriate and participatory approaches. Training and workshops will be conducted on climate-related information to support the adoption of CCA interventions. The knowledge and information needs of vulnerable groups – in particular female-headed households and illiterate farmers – will be identified and incorporated into the awareness-raising programmes.

The project will also implement activities that improve community-level participatory learning, knowledge management and the exchange of information at sub-Zoba, Zoba and national levels. This will include continuously monitoring and documenting the

effectiveness of the project activities, particularly CCA interventions aimed at enhancing food security and integrated water resources management.

**Outcome 3.1: Increased monitoring, knowledge-sharing and awareness at Zoba, sub-Zoba, Kebabi and community levels on: i) climate change risks; ii) climate- and ecosystem-smart watershed restoration; iii) climate-smart agricultural technologies and measures; and iv) the sustainable use and management of natural resources.**

*Output 3.1.1: Public awareness-raising and education campaigns conducted in the Tsilima Region using all forms of media (including inter alia print, radio, art and drama)*

The LDCF-financed project will implement awareness-raising measures to increase the understanding of Eritrean communities on the effects of climate change and potential CCA interventions. Awareness-raising initiatives will use local media, drama productions and community radio networks to assist in the broadcasting of adaptation advice such as: i) a cropping calendar of sowing, planting and harvesting times; ii) climate-smart agricultural practices, including drought-resistant varieties of local crops, suitable seed provision and mulch application; and iii) water-efficient irrigation technologies. Conventional extension methodologies will be improved with the adoption of a “learning-by-doing” approach that introduces participatory experiential learning methods. For example, exchange visits between communities of different Kebabis and demonstration sites will expose farmers to successful practices that have been implemented elsewhere. Climate-resilient land-use and area development plans (see Outcome 2.1) and practices will potentially be revised in accordance with lessons learned via exchange visits. Youth and school groups will also participate in implementing CCA interventions. This will be undertaken through field days and study tours, as well as school projects and youth competitions. Lessons learned from the project will be made available for inclusion into educational curricula. Finally, best practice guides for CCA will be published in local languages to support the widespread adoption of the interventions promoted by the project.

Indicative activities for Output 3.1.1 include:

- Conduct a public awareness campaign using local media to inform communities on the effects of climate change and benefits of appropriate CCA interventions. The campaign should include the development and dissemination of easily comprehensible, user-friendly literature on CCA and monitoring of CCA interventions as well as watershed restoration sustainable water use and management techniques for use by CBOs and local communities. These knowledge products will provide guidance on how to develop and implement watershed restoration and management practices, climate-resilient land use and area development plans as well as climate-smart agricultural practices.
- Organise local-level awareness-raising campaigns and training programs for farmers on lessons learned and best practices. Adopt experiential learning methods including demonstration plots, farmer-farmer exchanges, field visits and study tours to publicise project activities and lessons learned from implementation experience. These field visits will include school and youth groups who will be encouraged to participate in various activities and competitions.
- Establish an education programme in local schools on the benefits of CCA interventions, including climate-smart agricultural technologies, livestock production practices and alternative income-generating activities.
- Provide support to the development and broadcast of farmer radio shows that provide easily accessible and useful agricultural and weather-related information to rural households.

*Output 3.1.2: A communication strategy developed and implemented to collect and disseminate knowledge and best practices on: i) watershed restoration; ii) climate-smart agriculture; iii) sustainable land management; and iv) natural resource use.*

The LDCF-financed project will develop and implement a communication strategy to raise awareness on the benefits and opportunities offered by CCA interventions. The strategy will be developed for use by national, Zoba and sub-Zoba administration, including extension agents. This approach will be underpinned by the collation of: i) best practice information; and ii) lessons learned during project implementation.

Under this output, the research and knowledge products generated by the project’s activities, including lessons learned and best practices will be made publicly available in an easily digestible form to support other ongoing and future CCA interventions. The project will collect knowledge on the effectiveness of the CCA interventions implemented in each of the selected KAA. Experience-sharing programs – combining workshops and visits to model farming systems, networking and distribution of training manuals and relevant literature – will be promoted by responsible institutions. In addition, frequent joint field visits and community consultations by policy-makers, National Steering Committee and Project Technical Committee will be undertaken. These interactions will raise awareness and acceptance among policy-makers for the smooth implementation of the project activities, as well promote up-take and up-scaling and replication elsewhere in Eritrea.

In addition, the project will rely upon the information-sharing platform – established under Outcome 1.1 – for the wide scale dissemination of information and lessons generated from the project interventions nationally. The UNDP’s Adaptation Learning Mechanism (ALM), wikiADAPT will be used to disseminate information globally.

Indicative activities for Output 3.1.2 include:

- Facilitate community consultations with policy-makers, the National Steering Committee and Project Technical Committee.
- Collate and synthesise lessons learned and best practices from project results, including the benefits of adaptation interventions. Best practices and lessons learned to be disseminated: i) nationally through the information-sharing platform; and ii) globally via the UNDP’s Adaptation Learning Mechanism (ALM) and wikiADAPT, as well as the Global Adaptation Network (GAN) and the Africa Adaptation Knowledge Network (AAKN).

*Output 3.1.3: A strategy developed and implemented for: i) scaling up lessons learned to other Zobas, sub-Zobas and Kebabis; and ii) informing decision-making at national level.*

The LDCF-financed project will develop a strategy for scaling up lessons learned during project implementation to other sub-Zobas and Zobas. Lessons learned and best practices will be shared through the information sharing platforms developed under Outcome 1.1 to: i) inform policy- and decision-making on a national level; and ii) influence the implementation of the baseline programmes in other parts of the country. The strengthened extension services, exchange and field visits will facilitate the replication and scaling up of the project activities elsewhere in Zoba Debub and throughout Eritrea.

Indicative activities under Output 3.1.3 include:

- Develop and implement a strategy for scaling up and replicating project activities and lessons learned throughout Eritrea.
- Establish a good practice database, including traditional and project activities.
- Organise a regional forum to review and integrate CCA interventions into the regional development plan, Food Security Strategy and IWRM action plans.

*Output 3.1.4: A gender strategy developed and implemented, which includes capacity building and enhancing the participation of women in planning, selecting, implementing adaptation measures and monitoring their success.*

The LDCF-financed project’s activities will respond to the anticipated effects of climate change on women and recognize the gender-differentiated impacts of climate change on men and women and their households. A particular focus of the gender strategy will be on awareness and training of women’s associations and the production of gender-sensitive education materials. This approach will promote local community support and ownership of the project activities. Women and female-headed households in the Tsilima Region will directly benefit from the project through an increased capacity for CCA, as well as increased community coordination and ownership.

Indicative activities under Output 3.1.4 include:

- Update and extend the portfolio of training modules to include gender aspects associated with climate change that are not covered within the current portfolio. The training programmes will be tailored to the local context with respect to the needs of women.
- Collaborate with the NUEW to ensure that women’s needs and interests are represented in the: i) preparation of land use and area development plans; ii) strengthening and/or establishment of CBOs; and iii) development of community bylaws, under Outcome 2.1.
- Create a discussion forum to facilitate dialogue on gender issues between the CBOs, Kebabi and sub-Zoba administration.
- Develop a gender strategy to strengthen the adaptive capacity of women to prepare for the adverse effects of climate change.
- Document lessons learned on the experiences and coping strategies of women and men and the implications for future project and program design.
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Incremental cost reasoning: The project will increase the effectiveness of the baseline being invested by the government in the agriculture and water sectors and the ongoing water and soil conservation measures designed to augment water availability to increase agricultural productivity in pursuit of food security. It will do this through mainstreaming climate change risks into these sectors and promoting the resilience of ecosystems and the livelihood practices of the communities in the Tsilima region, particularly farming livelihoods. The LDCF resources are designed to be used on activities which are inherently cost effective, and GEF6 CEO Endorsement /Approval Template-Sept2015

the following cost effective measures have been identified during the PPG phase: i) implementing an integrated approach to CCA at watershed level; ii) piloting a community-based EWS in sub-Zoba Dbarwa; and iii) conducting a range of training and awareness raising activities for relevant stakeholders. During the process of selecting CCA interventions, alternative approaches for reducing climate vulnerability of local communities at project intervention sites in Eritrea were considered. The costs were determined for small-scale, on-the-ground interventions identified through consultations undertaken at Zoba and sub-Zoba administration levels, as well as at community levels. An evaluation of their cost effectiveness vis-a-vis that of the measures proposed is described below.

In order to reduce costs and to avoid duplication, the LDCF-financed project will pursue an active partnership strategy with other ongoing initiatives, including projects such as those implemented through GEF Small Grant Programme. Through this collaboration, the project will build on the lessons learned and best practices from past and current projects and ensure that cost effectiveness is included as a selection criteria or in the identification of appropriate adaptation practices and implementation protocols.

The project will enhance and make use of existing national and sub-national structures where possible. Project implementation will be almost exclusively undertaken by existing government and local authority structures. This approach is believed to be particularly cost effective, as it reduces costs that would need to be spent on consultant-driven implementation, and it builds the capacity of the government system for ongoing and more widespread implementation of similar climate-sensitive development. For example, NARI will coordinate data collection and analyses undertaken by stakeholders under Outcome 2. Increasing the capacity of existing agencies will reduce project costs, strengthening institutional support and increasing the potential for project approaches and newly capacitated staff to be integrated into departments, ministries and institutions beyond project termination. This will contribute to an enabling environment for integrating CCA into long-term planning. Moreover, the size of the Project Coordination Unit (PCU) has been carefully considered to keep costs down while still ensuring effective management of the project, it is likely that staff for the PCU will be largely selected from existing government staff and supported through government co-financing, thereby ensuring that capacity developed through the course of the project will be retained within government institutions.

Importantly, the LDCF-financed project includes technical training for local community members on implementing, maintaining and monitoring project interventions. The training of community members in conjunction with the adoption of a participatory “learning by doing” approach will reduce the overall cost for monitoring project activities. Moreover, it will promote sustainability of the interventions beyond the lifespan of the project.

The LDCF-financed project focuses on building adaptive capacity and the use of both hard and soft engineering interventions which are locally appropriate. The use of exclusively hard infrastructure – such as check dams, gabions, and stone lines – was rejected for various reasons. Firstly, hard engineering interventions are considerably more expensive than softer interventions like ecosystem management. Therefore, the exclusive implementation of hard interventions would result in fewer interventions being implemented and consequently fewer beneficiaries. Secondly, hard interventions may have unintended consequences such as transferring local risks up- or down-stream. A mix of hard and soft climate-smart CCA interventions will be less costly – based upon the cost estimates for hard interventions received from Zoba and sub-Zoba administrations, relevant ministries and departments – and provide protection to more beneficiaries than the exclusive implementation of hard infrastructure. The project promotes capacity building, training and skills development across all levels of resource use and management, including community members, farmers, extension officers, research/scientific institutions, community-based organisations, technical officers within government institutions as well as decision-makers/policy-makers. This is seen as a cost-effective approach to building adaptation capacity and resilience in Eritrea, and in particular the Tsilima region.

With regards to the benefits of the proposed interventions, an evaluation of soil and water conservation projects by the World Food Programme indicates that the financial rate of return for physical soil and water conservation structures is ~30% in drier areas<sup>8</sup>. However, that does not take into account the off-site benefits of such structures when implemented in conjunction with forestry measures, which include inter alia: i) increased groundwater recharge; ii) reduced formation of gullies; iii) reduced sedimentation of downstream irrigation dams; iv) reduced flooding; and v) increased biodiversity. In addition, the community members involved in project implementation indicated that conservation and forestry measures had a positive impact on their livelihoods. Examples of such impacts included higher groundwater levels in downstream wells compared to groundwater levels in watershed areas where no measures had been implemented and levels continue to decline. A cost-benefit analysis of the CCA interventions will be undertaken during project implementation to inform the replication and scaling up of CCA interventions elsewhere in Eritrea.

The project aims to reach close to 17,000 households, and 57% of these are headed by women. These households will directly benefit from CCA interventions that focus on reducing climate vulnerability through community livelihood enhancement. Crop insurance was identified as a potential solution to compensate farmers for losses incurred through extreme weather events.

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<sup>8</sup> World Food Programme. 2005. Report on the cost-benefit analysis and impact evaluation of soil and water conservation and forestry measures. GEF6 CEO Endorsement /Approval Template-Sept2015

However, such insurance mechanisms are reliant on inter alia: i) comprehensive climate monitoring systems that are explicitly linked to crop yields; ii) the ability of farmers to pay insurance premiums; and iii) the willingness and ability of government to subsidise insurance premiums. The implementation of such an insurance scheme is currently considered unfeasible for Eritrea for a number of reasons. Firstly, there is insufficient capacity for climate monitoring that is directly linked to crop yields to inform if/when insurance pay-outs should occur. Secondly, the majority of farmers in Eritrea practice rain-fed subsistence agriculture, which leads to low levels of income. As such, they would be unable to service insurance premiums and would consequently be unable to participate in insurance schemes. Based on this analysis, the LDCF-financed project will instead focus on diversifying and strengthening agricultural livelihoods to increase the income earned by subsistence farmers. For example, the project will explore the possibility of value chains with low investment and high returns such as fruit and honey production and processing. This will allow farmers to increase their savings and/or further invest in productive assets, thereby strengthening their capacity to recover from climate shocks.

Adaptation benefits: LDCF resources have been designed to be used in full alignment with Eritrea's national priorities and identified needs related to CCA. In particular, through its focus on CCA in the mountain ecosystems, LDCF resources will contribute to the national priorities identified under the UNFCCC by addressing sensitivity to climate change risks. The project will also contribute to addressing national development challenges, such as water scarcity, food security, land degradation, poverty and vulnerability of Eritreans to climate change in the Tsilima Region. Importantly, the financing will also contribute towards the achievement of Sustainable Development Goals 1, 2, 5, 6, 13 and 15 as outlined under Section 1 (Development Challenge). The emphasis of the project's activities on degraded ecosystems, with a particular focus on upstream catchments, will result in the restoration and improved management of 9,000 hectares of land. Because local communities depend on natural resources for their livelihoods, improved environmental management will contribute directly to reducing poverty and increasing food security, thereby contributing to both MDGs and Sustainable Development Goals. Additionally, training communities to rehabilitate and manage ecosystems in a climate-smart manner will increase their resilience to climate shocks as well as improve their livelihoods through greater income-generating opportunities.

The project also has specific national benefits. These include increased access to climate information, and awareness and understanding of the impacts of climate change on the Tsilima Region by sectoral ministries, academic and research institutions, as well as local government. This will be achieved through undertaking groundwater and surface water resource assessments and establishing a groundwater monitoring strategy based on the results thereof. Increased access to climate information and the availability of a monitoring system will inform climate-related research, land-use planning and informed design of adaptation interventions. Furthermore, training to be supported through the project will strengthen the technical capacity of government staff at local and national levels to analyse, predict and respond to climate change effects, access policy-relevant data and deliver relevant information to local communities.

An additional benefit of the project at national level will be increased inter-ministerial coordination and institutional capacity to adapt to climate change in Eritrea. The implementation of coordination mechanisms and the development of an information-sharing platform/forum will promote collaboration between ministries as well as research and academic institutions, donors and NGOs that will advance CCA planning at the national level.

Without the project, local communities and the ecosystems upon which they depend will continue to be vulnerable and at risk from the impacts of climate change. Progress towards poverty reduction and socio-economic development will therefore be hampered. The project will provide local government and communities with practical tools, technologies and capacities for an integrated approach to adaptation. Households will be trained to implement CCA interventions at farm and landscape levels. This will be done through practical demonstrations over 9,000 hectares to improve the maintenance and enhancement of ecosystem functioning, integrity and resilience. About 17,000 households, in the Tsilima Region, 57% of whom are female-headed, will directly benefit from LDCF resources. It is envisioned that these community members will participate directly in the implementation of the project's activities, particularly those related to agricultural and ecological interventions.

In Eritrea, women play a central role in managing livelihoods often relying on climate-sensitive natural resources for their livelihoods. However, these stakeholders have insufficient access to relevant information and skills to manage the negative effects of climate change on these natural resources. To contribute to reduced marginalisation and gender equality, the LDCF project activities will include women in activities to increase their capacity to adapt to climate change. For example, alternative livelihoods and community structures will be implemented that provide equal adaptation benefits for both women and men. In addition, community-based land use and area development plans will focus on including female-headed households. Moreover, gender and youth action groups will be consulted when public awareness campaigns are designed and information materials are disseminated. These consultations will ensure that information reaches female stakeholders within their networks and they also benefit from the best practices and lessons learned during project implementation.

The direct positive effects of the project on improving ecosystem services – such as food production, water quality and availability, wood production and flood control – will be enhanced through the application of improved land management practices at the local level. The generation of an enabling and environmentally-informed policy environment will also contribute to the positive effects of the project. Through conserving or improving ecosystem conditions, ecosystem services will improve resilience against threats such as droughts, floods, crops and livestock diseases and pests. Strengthening the livelihood assets on which communities depend – such as rangelands – safeguards household income as households are less prone to – and in a better position to recover from – floods and droughts.

Within the surrounding areas, the project will generate indirect benefits to an estimated ~75,000 people through *inter alia*: i) reduced vulnerability to extreme weather events such as flooding; ii) improved agricultural productivity through reduced erosion and loss of fertility of soil; and iii) improved quantity and quality of water as a result of ecological interventions. Additionally, the community-based early warning system (EWS) piloted in sub-Zoba Dbarwa will improve the capacity of local communities to respond to events such as floods and droughts. A functional EWS will also help to prevent loss of life, injuries and damage to property by warning people timeously of impending floods. Furthermore, training of decentralised extension agents from MoA and other relevant local government representatives will promote the replication of EWS in other local communities, further preventing loss of life and damage to property.

Additional national and local benefits are the enhanced capacities in planning and executing projects, undertaking M&E and empowering communities to take charge of their own livelihoods. The immediate benefits of the project will be that government institutions, NGOs and vulnerable communities have increased adaptive capacity as they: i) are more aware of the linkages between climate resilience and ecosystem management; and ii) acquire the necessary skills to apply adaptive approaches. This increased capacity will also support long-term benefits by promoting CCA beyond the project implementation period. The improvement of the knowledge base applicable to the Tsilima Region will result in better decision-making and innovation in terms of agricultural production and an increase in agricultural productivity. In addition, improved knowledge and access to technologies will result in: i) improvement in food security through increased production; ii) reduction in local communities' vulnerability to floods and droughts through more resilient ecosystems and production systems; iii) enhanced adaptive capacity of local communities; and iv) improved service delivery by government and non-government institutions through improved skills and knowledge.

#### Innovativeness, sustainability and potential for scaling up:

*Innovativeness:* The Eritrean philosophy of self-help and self-reliance has been instrumental in the implementation of extensive soil and water conservation interventions throughout the country. Involving Eritrean communities in the design, development and implementation of climate-resilient land-use planning and CCA interventions at the watershed level, is therefore a highly innovative and sustainable approach. Adaptation measures that involve extensive engineering solutions and technologies are beyond the reach of many rural communities within Eritrea. Therefore, the project is focusing on developing the adaptive capacity of local communities through the use of nature-based solutions in combination with some engineering interventions which will provide practical and locally appropriate “soft” adaptation measures. In addition, to support information sharing, a platform or forum will be developed for networking and sharing of information between relevant stakeholders at various levels of decision-making and implementation. At the regional and national level, this platform/forum will promote information sharing and inter-ministerial or inter-sectoral and institutional collaboration on climate change and adaptation in Eritrea. At local levels, collaboration and consultation between communities, villages and resource-user groups will also be facilitated through bringing together different committees that represent different interests in land use planning and decision-making.

*Sustainability:* The LDCF-financed project was developed through consultation with various stakeholders. Consultations were undertaken during the PPG phase (see Annex M of PRODOC for a full list of individuals/groups consulted) and will be undertaken throughout the project implementation period to support the sustainability of interventions beyond the duration of the project by prioritising the long-term needs of the local communities in the Tsilima Region. Sustainability will be supported by multiple measures, as detailed below.

- A consultative approach supports the sustainability of CCA interventions beyond the duration of the project by ensuring that the long-term needs of vulnerable communities are prioritised. Local stakeholders were consulted during the PPG phase and similar consultations will be ongoing as part of the project implementation phase. Furthermore, the project design team engaged with relevant national stakeholders and experts to align activities with national priorities and development goals. Several project interventions will be implemented at a community and village level (see Section 2.4 in the PRODOC). The maintenance of such interventions is relatively low cost and does not require complex technical skills, therefore enabling maintenance by local communities beyond the duration of the project. Furthermore, these interventions will continuously generate economic revenues for communities in the long-term.

- To support the mainstreaming of climate change into planning and policies, the project will strengthen the capacity of relevant government stakeholders and departments to plan and implement CCA interventions. The strong emphasis on capacity-building, training and institutional strengthening – particularly with respect to CCA – will reinforce the long-term political and financial commitment of policy- and decision-makers to the project interventions. Furthermore, capacity building will be complemented by a strategy for maintaining technical capacity in the MoA, MOLWE and other relevant departments and institutions. These interventions will strengthen the institutional environment for CCA planning both during and after the project period. Close involvement of numerous GoE institutions and departments, as well as local communities in the project’s implementation will further promote the future incorporation of the project’s approach to climate change into on-going planning and strategies.
- By strengthening the research capacities of NARI and other institutions, the project will promote research which will inform and strengthen the evidence base for CCA interventions in Eritrea. The outcome of such research will include: i) assessments on CSA including useful and climate-resilient species; and ii) groundwater and surface water assessments. The knowledge that is generated through this research will promote the sustainability of project interventions and inform the design of future CCA interventions in Eritrea.
- The strengthened capacity of ministries, departments and institutions in conjunction with the improved generation and collation of information on CCA and sustainable land, forestry and water resources management will support technical staff within the MoA and MOLWE to apply the project approach on an ongoing basis. By implementing a community-based land-use planning and management system, the project will reduce uncertainty about roles, obligations, costs and benefits of the use of communal lands. Furthermore, the development of such plans and by-laws will foster and support community and household ownership of project interventions, which will result in greater support from the project beneficiaries. In addition, the project will implement a long-term strategy for monitoring and evaluating CCA and sustainable land, forestry and water resources management interventions for MoA, MOLWE and other relevant stakeholders. Lessons learned and best practices from the project regarding environmental sustainability and climate resilience will be shared and scaled up across the country to increase the project’s impacts.

*Replicability:* The interventions implemented by the project are designed as pilot demonstrations that can be replicated in other areas within Eritrea. By directly informing the National Food Security Strategy and the IWRM Action Plan, which are key national planning documents, the project’s interventions will inform future CCA in Eritrea. Adaptation within the agriculture and water sector will therefore have significant replication potential and benefit from the implementation of the project in the Tsilima region. The design of the project’s activities includes several measures that will support replicability of successful activities beyond the project implementation period. For example, all the components and their technical elements are replicable in all geographical areas of the country and beyond, where ecological conditions are similar. These measures are discussed in further detail below.

- A “learning-by-doing” approach will be adopted to build technical capacity for planning and implementing CCA. This will address climate change priorities at sub-Zoba, Zoba and national levels, while also informing national development plans and policies. The direct involvement of government institutions will demonstrate the potential for integration of approaches and strategies proposed under this project into on-going planning processes.
- Policies and community by-laws will be developed, which will contribute to the technical knowledge base on climate-resilient land-use planning, thereby facilitating replication. In addition, the tools and lessons learned from developing the community-based land use and area development plans will inform similar approaches in other areas within Eritrea, with support from the ministries involved. By designing and implementing tools at the local level, the project will facilitate a learning approach that is sustainable and can be shared among household and community members.
- The involvement of extension services and CBOs in the development of climate-resilient land use and area development plans will ensure ownership of the project initiatives as well as on-the-job skills development for all technical staff involved. In addition, by strengthening the capacity of research institutions to provide knowledge-based advice to the extension services, the project will increase the probability of replication because the research institutions have a national mandate. Similarly, the extension services have a broader catchment area than the project intervention sites; therefore an empowered extension service will ensure the adoption and implementation of the project’s proven CCA interventions in other suitable areas within Eritrea. The institutionalisation of knowledge and evidence-based agricultural extension advice at the national level will also ensure replication.
- The benefits of the interventions in the Tsilima Region will be assessed. Lessons learned from this process will be collated and disseminated to support replication of CCA and sustainable forestry, land and water resources management in other parts of Eritrea. In particular, pilot activities will generate evidence on the cost-effectiveness of CCA interventions, including agricultural and ecological interventions, which can inform policy and budgetary reviews and adjustments. Furthermore, best practices and lessons learned from the project will be collated and disseminated nationally.



The project has therefore been designed to ensure that: i) lessons are replicable; ii) training and capacity building are sufficient to allow the transfer of expertise to other initiatives and locations; and iii) replication mechanisms are in place and institutionalisation of new and improved approaches is facilitated.

A.2. *Child Project?* If this is a child project under a program, describe how the components contribute to the overall program impact. **N/A**

A.3. Stakeholders. Identify key stakeholders and elaborate on how the key stakeholders engagement is incorporated in the preparation and implementation of the project. Do they include civil society organizations (yes X /no )? and indigenous peoples (yes  /no X)? <sup>9</sup>

The implementation strategy for the LDCF-financed project includes extensive stakeholder participation. Details of the stakeholder participation during the PPG phase are provided in the table below. At a broad level, participation and representation of stakeholders will be conducted through the governance structures to be put in place by the project as outlined and depicted in the organigram in section A.6 of this document (Institutional Arrangements) and section VII of the PRODOC (Governance and Management Arrangements) and through the existing structures at national and local/village levels (e.g. VAC, CBOs, Farmer Associations). A stakeholder engagement plan for the implementation phase will be developed during the project inception workshop. Stakeholders will be engaged throughout the project implementation phase to: i) promote community understanding of the project's outcomes; ii) promote local community ownership of the project through engaging in planning, implementing and monitoring of the CCA interventions; iii) communicate to the public in a consistent, supportive and effective manner; and iv) maximise synergy with other ongoing projects.

Outcome	Output	Stakeholders	Key Responsibilities
1.1 Capacity of research institutions to undertake climate-related research increased.	1.1.1 Capacity and resource needs assessment undertaken and capacity development strategy and training programme developed and implemented for NARI, which includes training on climate change and water resources management, as well as research/data collection, analysis and packaging/publication of information.	NARI MOA	Overseeing: <ul style="list-style-type: none"> <li>• Participation in the capacity and resource needs assessment.</li> <li>• Preparation of capacity development strategy.</li> <li>• Training programme developed and implemented.</li> </ul>
	1.1.2 Network and information sharing platform on CCA and climate-smart agriculture (CSA) developed at national, Zoba and sub-Zoba levels.	NARI MOLWE MoA MoTC Zoba, sub-Zoba and Kebabi administrations	Coordinating: <ul style="list-style-type: none"> <li>• Development of network and information sharing platform.</li> <li>• Revitalisation of National Food Information System.</li> <li>• Establishment of Farmer Advisory Services.</li> <li>• Establishment of linkages with international institutions.</li> </ul>
	1.1.3 Technical and financial support provided to NARI (in association with other academic and research institutions) for conducting research and producing research outputs/products on CSA and production systems, including but not limited to: i) drought resistant and early maturing crops; ii) sustainable water use and conservation practices; iii) conservation agriculture practices, including tillage management and soil fertility; iv) sustainable landscape management; and v) livestock production and grazing management.	NARI MOLWE MoA MoTC Zoba, sub-Zoba and Kebabi administrations Farmers	<ul style="list-style-type: none"> <li>• Provision of technical and financial support to NARI.</li> <li>• NARI – action research and field demonstrations on climate-smart agricultural production practices</li> </ul>
	1.1.4 Climate information and monitoring systems developed in association with relevant line ministries, departments – in particular, the Meteorological Services Unit	NARI MoTC MOLWE MoA	Coordinating: <ul style="list-style-type: none"> <li>• Implementation of operational EWS developed in a selected project intervention site.</li> </ul>

<sup>9</sup> As per the GEF-6 Corporate Results Framework in the GEF Programming Directions and GEF-6 Gender Core Indicators in the Gender Equality Action Plan, provide information on these specific indicators on stakeholders (including civil society organization and indigenous peoples) and gender.

	– and local communities based upon data received from hydro-meteorological stations installed under Output 2.2.2	Zoba and sub-Zoba administrations WHO NUEY NUEW Ministry of Health	<ul style="list-style-type: none"> <li>• Training of extension agents, local government representatives and community members.</li> <li>• Development of flood and drought early warning response plans with pilot communities.</li> <li>• Implementation of community-based climate monitoring and EWS in selected project intervention site, including on public health (e.g. malaria and dengue fever outbreaks are now on the increase in highlands).</li> </ul>
1.2 Capacity of extension service institutions to provide knowledge-based climate-smart extension services to agriculture, livestock production and water management increased.	1.2.1 Capacity and resource needs assessment, development and training programmes implemented within institutions involved in extension services on inter alia sustainable land, forestry and water resources management	NARI MOLWE MoA Zoba, sub-Zoba and Kebabi administrations	Coordinating: <ul style="list-style-type: none"> <li>• Review and assessment of capacity and capacity needs</li> </ul>
	1.2.2 Extension packages reviewed and updated to include best practices and climate-smart approaches through the provision of technical and financial support at national, Zoba, sub-Zoba and Kebabi levels.	MOLWE MoA Zoba, sub-Zoba and Kebabi administrations CBOs Farmers	<ul style="list-style-type: none"> <li>• Review of and updating extension packages.</li> </ul>
	1.2.3 A long-term strategy developed and implemented for monitoring and evaluating climate-smart: i) water resources use and management; ii) crop productivity; and iii) livestock productivity	MOLWE MOA NARI Zoba, sub-Zoba and Kebabi administrations Farmers	Overseeing: Development of monitoring and evaluation strategy.
2.1 Climate-resilient land use planning implemented over 9,000 hectares of the Tsilima Region.	2.1.1 Based on the assessments undertaken in Output 2.2.1: i) identify and map drought and flood prone areas; and ii) develop and implement community-based land use and area development plans in the Tsilima Region.	MOLWE Zoba, sub-Zoba and Kebabi administration CBOs Farmers	Overseeing: <ul style="list-style-type: none"> <li>• Flood and drought vulnerability mapping.</li> <li>• Development and implementation of community-based land-use plans.</li> </ul>
	2.1.2 Existing CBOs strengthened, including inter alia Village Agricultural Committees, Water User Associations and Farmers' Associations to coordinate local level participation in climate change adaptation, land use and development planning.	Zoba, sub-Zoba and Kebabi administrations CBOs Farmers	Coordinating: <ul style="list-style-type: none"> <li>• Establishment and strengthening of community institutional structures.</li> </ul>
	2.1.3 Technical support provided to the Zoba and sub-Zoba administration to inform implementation of the land redistribution process through the: i) classification of land according to potential land uses; ii) mapping of coordinates; and iii) assessment of the availability and quality of resources (e.g. soil and water).	MOLWE MoA Zoba, sub-Zoba and Kebabi administrations	Overseeing: <ul style="list-style-type: none"> <li>• Mapping and classification of land to inform future allocation of individual plots to households.</li> <li>• Resource availability and quality assessments</li> </ul>
2.2 Integrated water management operationalised across the Tsilima Region, increasing water availability and land under irrigation.	2.2.1 Groundwater and surface water resources assessment undertaken and a groundwater monitoring strategy (including a system of data collection and information exchange on water use and projected demand) developed and implemented in the Upper Mereb catchment.	MOLWE NARI Zoba, sub-Zoba and Kebabi administrations CBOs Farmers	Coordinating: <ul style="list-style-type: none"> <li>• Assessment of the groundwater and surface water resources.</li> <li>• Development and implementation of a groundwater monitoring strategy.</li> <li>• Engagement with all stakeholders.</li> </ul>

	2.2.2 Hydro-meteorological stations established and/or refurbished at Mendefera, Dbarwa and Halhale.	MOLWE MoA NARI	Overseeing: <ul style="list-style-type: none"> <li>• Installation of hydro-meteorological stations</li> <li>• Collection and analysis of data from hydro-meteorological stations.</li> </ul>
	2.2.3 Climate-smart watershed restoration and management measures identified and implemented, including: i) water harvesting and storing interventions; ii) flood diversion and water spreading facilities; and iii) on-farm and off-farm soil and water conservation measures.	MOLWE MoA NARI Zoba, sub-Zoba and Kebabi administrations CBOs Farmers	Coordinating: <ul style="list-style-type: none"> <li>• Identification and implementation of improved water use and management techniques.</li> <li>• Support to farmers on implementation of on-farm water conservation measures</li> </ul>
	2.2.4 Local communities and households trained to undertake sustainable water use and management, including inter alia water harvesting, construction and maintenance of hard and soft engineering interventions.	MOLWE MoA Zoba, sub-Zoba and Kebabi administrations CBOs Farmers	Coordinating: <ul style="list-style-type: none"> <li>• Training of: i) technical staff on the assessment of groundwater resources and monitoring; and ii) local communities and households on sustainable water use and management.</li> </ul>
2.3 Increased food production through the implementation of climate-smart agricultural practices across the Tsilima Region.	2.3.1 Climate-smart agricultural practices – informed by research products generated under Output 1.1.3 and land use and area development plans prepared under Output 2.1.1 – developed and transferred to farmers, including :i) drought- and disease-resistant varieties; ii) integrated crop-livestock production systems; iii) conservation agriculture; iv) agroforestry; v) silvopasture; and vi) rangeland and livestock management.	NARI MOLWE MoA Zoba, sub-Zoba and Kebabi administrations CBOs Farmers	Overseeing: <ul style="list-style-type: none"> <li>• Implementation of a range of climate-resilient agricultural technologies and methods within and around pilot communities.</li> <li>• Establishment of demonstration plots at each of the project intervention sites.</li> <li>• Training of local communities on climate-smart agricultural technologies and livestock production methods.</li> </ul>
	2.3.2 Alternative income-generating livelihoods identified and implemented in selected communities.	MoA MOLWE NARI Zoba, sub-Zoba and Kebabi administrations CBOs Farmers	Coordinating: <ul style="list-style-type: none"> <li>• Development and implementation of alternative livelihood options.</li> <li>• Training of extension staff and local communities.</li> </ul>
3.1 Increased monitoring, knowledge-sharing and awareness at Zoba, sub-Zoba, Kebabi and community levels on: i) climate change risks; ii) climate- and ecosystem-smart watershed restoration; iii) climate-smart agricultural technologies and measures; and iv) the sustainable use and management of natural resources.	3.1.1 Public awareness-raising and education campaigns conducted in the Tsilima Region using all forms of media (including inter alia print, radio, art and drama).	Zoba, sub-Zoba and Kebabi administrations CBOs Farmers	Overseeing: <ul style="list-style-type: none"> <li>• Awareness-raising campaigns for stakeholders, academic institutions, NGOs, CBOS and local communities.</li> <li>• Implementation of a gender strategy</li> <li>• Disseminating lessons learned and knowledge generated through the project.</li> </ul>
	3.1.2 A communication strategy developed and implemented to collect and disseminate knowledge and best practices on: i) climate- and ecosystem-smart watershed restoration; ii) climate-smart agriculture; iii) sustainable land management; and iv) natural resource use.	NARI Zoba, sub-Zoba and Kebabi administrations	
	3.1.3 A strategy developed and implemented for: i) scaling up lessons learned to other Zobas, sub-Zobas and Kebabis; and ii) informing decision-making at national level.	MOLWE MoA NARI Zoba, sub-Zoba and Kebabi administrations	
	3.1.4 A gender strategy developed and implemented, which includes capacity building and enhancing the participation of women in planning, selecting, implementing adaptation measures and monitoring their success.	MOLWE MoA NARI Zoba, sub-Zoba and Kebabi administrations	

A.4. Gender Equality and Women's Empowerment. Elaborate on how gender equality and women's empowerment issues are mainstreamed into the project implementation and monitoring, taking into account the differences, needs, roles and priorities of women and men. In addition, 1) did the project conduct a gender analysis during project preparation (yes  /no)?; 2) did the project incorporate a gender responsive project results framework, including sex-disaggregated indicators (yes  /no)?; and 3) what is the share of women and men direct beneficiaries (women 57%, men 43%)? <sup>10</sup>

Gender is a complex issue in Eritrea. Although women have equal rights in terms of national law, they are still disadvantaged in terms of access to economic opportunities and decision-making. Gender equality is, however, enshrined in the country's legal frameworks, including the National Policy on Gender (2004) and the National Gender Action Plan (2003-2008). In addition, legislation has been passed relating to gender equality issues, including tenure of land. The LDCF-financed project will therefore build on and seek to alleviate gender disparities likely to be imposed by climate change regimes on natural resource based livelihoods. Consequently, there is increasing recognition for women as natural resource managers, evident in their greater leadership representation in contemporary community structures (See Annex M – Baseline Report for more details).

Women farmers are increasingly taking charge of rural households and are taking on a considerable burden. Surveys suggest that Eritrean women face the following problems: i) access to resources such as land and water; ii) access to credit; iii) design limitations including plot size and allocation, as well as labour; and iv) training and extension is limited. Various community-based irrigation programs have been implemented in Eritrea which have proven to generate significant benefits to female headed households. For example, women farmers have increased responsibility and improved their skills in managing both irrigation projects and water management systems. As a result of such programs, women have also increased their financial capacity and the livelihoods of their families. However, there are certain factors which constrain these programs and women's participation in particular including: i) shortage of labour adding to their already burdensome household tasks; ii) capital constraints; and iii) a lack of knowledge in water management.

In line with the National Gender Action Plan and the National Gender Policy, and the GEF and UNDP policies on gender, gender considerations will be mainstreamed into the project's activities to ensure that women are included in the selection of activities to increase their resilience and income-generation abilities, as well as in the various training and capacity-building programs. Women user groups and female headed households will be targeted. Output 3.1.4 will support the design of a gender strategy to specifically guide the differential needs of men and women and the equitable distribution of benefits, resources, status and rights to them. The project therefore strives to be gender responsive and support the empowerment of women and other vulnerable groups. In addition, technical support and advice will be sought from the National Union of Eritrean Women (NUEW) during the project implementation period to ensure that women's needs in Dbarwa are being properly addressed. In alignment with the rights-based approach to development put forward by Eritrea's National Gender Policy, the LDCF-financed project will identify opportunities to increase youth and female participation in the project's activities and decision-making processes. These will include:

- Inclusion of youth and gender-disaggregated indicators and targets in the results framework of the project, specifically for participation at government and community training workshops, demonstration activities and management committees.
- Targeting of gender- and youth-differentiated vulnerabilities into project interventions so that the most climate vulnerable groups within a community receive support from the project.
- Participation of stakeholders through project planning and implementation to ensure that youth and gender considerations are appropriately mainstreamed into project activities.

The guidance attached in Annex O of the PRODOC (Guidance for gender-sensitive and gender-responsive project implementation) will be further refined and finalised during the inception phase of the project to guide mainstreaming activities during implementation.

A.5 *Risk.* Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

- While the wording of the project risks have been altered since the original PIF to make them more specific, they remain based on the same underlying principles. These risks are summarised in the table below. As per standard UNDP requirements, the risks detailed in the table below will be monitored quarterly by the Project Manager/Coordinator. The Project Manager/Coordinator will report on the status of the risks to the UNDP Country Office who will record progress in the UNDP ATLAS risk log. Risks will be reported as critical when the impact and probability are high (i.e. 5). Management responses to critical risks will also be reported to the GEF in the annual PIR.

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<sup>10</sup> Same as footnote 9 above.

Project risks					
Description	Type	Impact & Probability	Mitigation Measures	Owner	Status
Severe drought or other extreme events	Environmental	Agricultural productivity and natural resources will be adversely affected by projected increases in temperature and decreases in rainfall. This will result in an increase in food insecurity.  P=4 I=4	Updated and improved climate information, forecasting and projections will be developed and used to fine-tune the technical aspects of project activities, such as the design of soil and water conservation measures. The project will adopt an ongoing learning-by-doing approach that will allow for iterative and adaptive management. Lessons learned will be generated to inform sustainability and replicability of similar interventions elsewhere in the region and in Eritrea.	MoA	Increasing
Continued decline of available groundwater, salinization of wells leading to potential scarcity and competition, leading to possible conflict.	Environmental	The decrease in groundwater availability will negatively impact the use of water for domestic, agricultural and livestock purposes. Consequently, agricultural productivity will decline, livelihoods will be negatively impacted and food security will decrease.  P=4 I=4	A number of project activities –including watershed restoration, construction of sub-surface dams, treatment of riverbanks, and soil and water conservation measures – have been identified and designed to recharge groundwater levels. The implementation of these project activities will therefore mitigate against this risk and reduce levels of competition for this scarce resource.	MOLWE	Increasing
Institutional capacity and relationships between line ministries are not sufficient to provide effective solutions to climate problems that are complex and multi-sectoral.	Organisational	Multilateral environmental agreements will not be properly implemented. And climate change will not be mainstreamed into sectoral policies and planning.  P=4 I=4	Capacity needs assessments will be undertaken, the results of which will inform capacity development. Institutional and technical capacity will be developed to support inter-ministerial coordination and planning around CCA.	MOLWE	No change
Limited human resources and institutional capacity, particularly at the Zoba and sub-Zoba level.	Organisational / Operational	Climate change interventions will not be properly planned and implemented.  P=4 I=3	The project has a strong capacity-building and training component, designed to promote effectiveness and sustainability at the local community, sub-Zoba and Zoba administration levels.	MoA	No change

Delays in project implementation, particularly in the development of infrastructure interventions.	Operational	Delays in project implementation may result in climate change interventions not being properly implemented.  P=4 I=3	Any bottlenecks in implementation will be identified. Feasibility studies will be undertaken for a number of the proposed water-related infrastructure components – such as the construction of sub-surface dams. Capacity-building programmes will be designed taking the results of the feasibility studies into consideration.	MOLWE	No change
Price escalation and unavailability of commodities and materials.	Financial	Climate change interventions, particularly hard engineering interventions (such as catchment dams) will not be implemented.  P=4 I=3	Escalating prices are beyond the control of the project and can only be mitigated by ensuring that the budget for infrastructural components is adequate. Moreover, strong government support will guarantee that sufficient resources will be available to the project.	MOLWE	Increasing
Potential conflict with neighbouring Ethiopia.	Political	Political instability will potentially affect the implementation of the climate change interventions in the project area.  P=2 I=2	Current commitments by GoSE suggest that Eritrea is likely to maintain stable political relationships with all its neighbours.	MND	No change

- As per UNDP policy, a social and environmental risk screening exercise was conducted at PPG stage to identify potential risk that may require monitoring and mitigating. The table below presents a summary of the identified risks, their probability and impact, as well as their significance, as indicated in the UNDP Social and Environmental Screening Procedure. The full SESP is annexed to the PRODOC (Section XII).

<i>Risk Description</i>	<i>Impact and Probability (1-5)</i>	<i>Significance (Low, Moderate, High)</i>	<i>Comments</i>
Risk 1: Duty-bearers do not have the capacity to meet their obligations in the Project	I = 5 P = 2	<b>Medium</b>	The proposed project is essentially a country-driven initiative. Therefore, Eritrean stakeholders will be the ultimate duty-bearers.
Risk 2: Rights-holders do not have the capacity to claim their rights.	I = 4 P = 3	<b>Medium</b>	The proposed project will be implemented in the Tsilima Plain and upper catchment area.
Risk 3: Proposed project will involve harvesting of natural forests, plantation development, or reforestation.	I = 1 P = 4	<b>Low</b>	Conservation agriculture and agroforestry techniques will be promoted by the project. Therefore, not all species of plant/tree that is used within the project will be indigenous. The proposed project will promote the regeneration of degraded land. In addition, agro-forestry and enclosures will be promoted.
Risk 4: Outcomes of the proposed project will be sensitive or vulnerable to potential impacts of climate change.	I = 1 P = 4	<b>Low</b>	The project is targeting degraded watersheds and agro-productive lands to increase their resilience to climate change.
Risk 5: Proposed project will involve large-scale	I = 3 P = 4	<b>Medium</b>	The project will construct two sub-surface dams for the storage of water.

infrastructure development (e.g. dams, roads, buildings).			
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Environmental and social grievances will be reported to the GEF in the annual PIR.

*A.6. Institutional Arrangement and Coordination.* Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

The project will be implemented following UNDP’s National Implementation Modality, according to the Standard Basic Assistance Agreement between UNDP and the GoSE, and the Country Program Action Plan (CPAP). The Implementing Partner for this project is the Ministry of Land, Water and Environment (MOLWE), and will be responsible and accountable for managing this project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of UNDP resources. MOLWE will work closely with the Ministry of Agriculture and the Ministry of Local Government/Zoba Debub to deliver specific project components as outlined in the project strategy.

The **Project Board** (also called Project Steering Committee) is responsible for making by consensus, management decisions when guidance is required by the Project Manager/Coordinator, including recommendation for UNDP/Implementing Partner approval of project plans and revisions. In order to ensure UNDP’s ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the Board, final decision shall rest with the UNDP Programme Manager (UNDP Resident Representative). The terms of reference for the Project Board are contained in Annex E of the PRODOC. The Project Board is comprised of the following individuals:

- ✓ An Executive: individual representing the project ownership to chair the Board.
  - e.g. Representative of the MOLWE, MoA, and MoLG.
- ✓ Senior Supplier: individual or group representing the interests of the parties concerned which provide funding for specific cost sharing projects and/or technical expertise to the project. The Senior Supplier’s primary function within the Committee is to provide guidance regarding the technical feasibility of the project.
  - e.g. Representatives of the MND and UNDP.
- ✓ Senior Beneficiary: individual or group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary’s primary function within the Committee is to ensure the realization of project results from the perspective of project beneficiaries.
  - e.g. Representative of Zoba Debub Administration.
- ✓ The Project Assurance role supports the Committee’s Executive by carrying out objective and independent project oversight and monitoring functions. The PC and Project Assurance roles should never be held by the same individual for the same project.
  - e.g. Representatives of Zoba Debub, Agriculture and Land Department.

**Project Technical Committee** is responsible for guiding the project implementation. The Project Technical Committee will be chaired by the PC and will be assisted by the MOLWE.

**Project Coordination Unit:** The PCU has the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the PSC. The PC’s prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The additional members of the Project Coordination Unit will provide project administration, management and technical support to the PC as required by the needs of the individual project or PC. The PC function will end when the final project terminal evaluation report – and other documentation required by the GEF and UNDP – has been completed and submitted to UNDP, including operational closure of the project.

**Project Implementation Committee** is responsible for the implementation of the project. The sub-Zoba Administrator will chair the Project Implementation Committee, which will obtain technical inputs and expert advice from the Project Technical Committee.

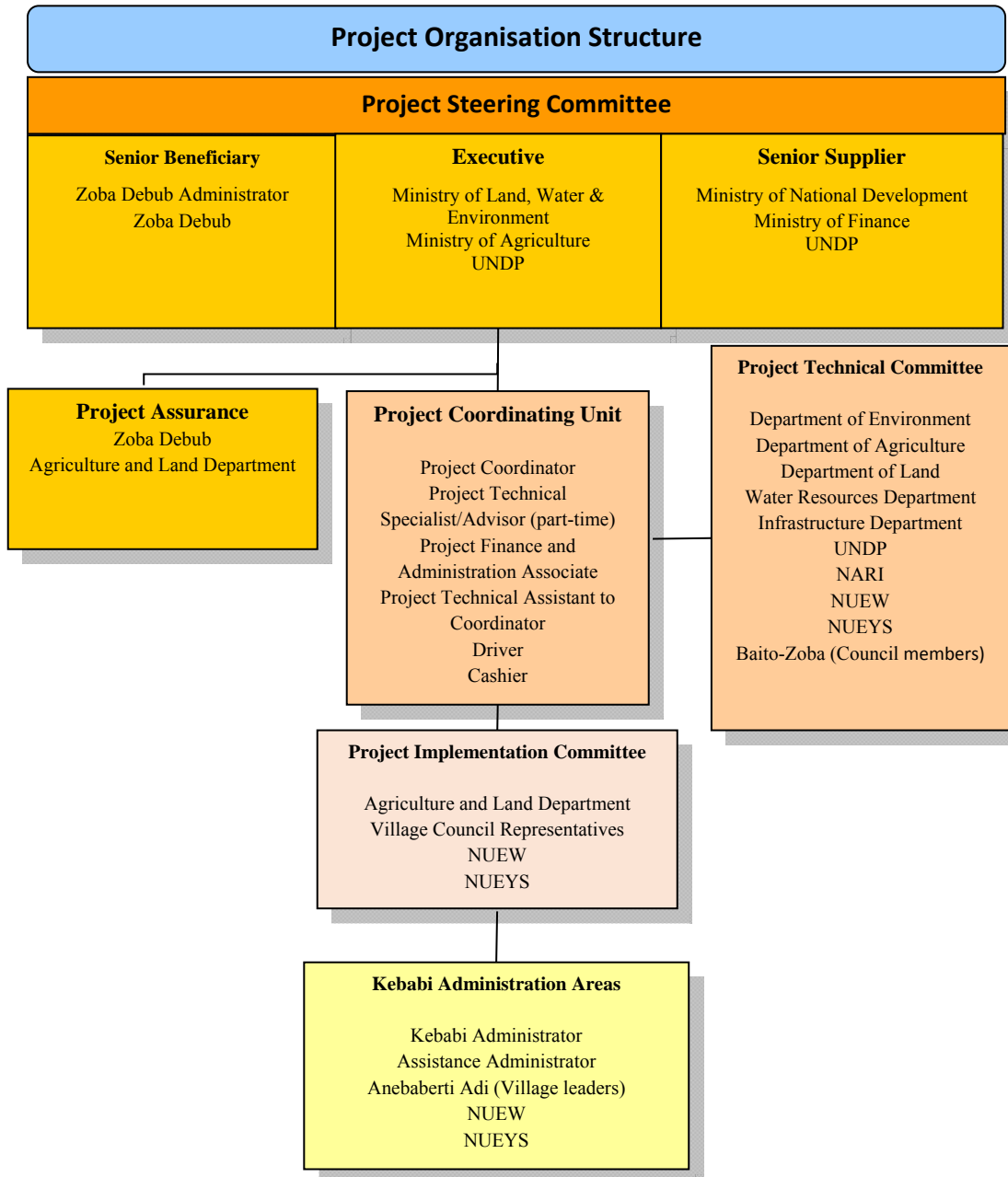
**Kebabi Administration Areas:** The KAA selected by the project will be the direct beneficiaries of the project’s interventions. The KAA will be responsible for: i) mobilising community labour; ii) sensitising communities to the project interventions; and iii) some in-kind contribution.

The **Project Manager** (or Project Coordinator) will run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the Board. The Project Manager function will end when the final project terminal evaluation

report, and other documentation required by the GEF and UNDP, has been completed and submitted to UNDP (including operational closure of the project).

The **project assurance** role will be provided by the UNDP Country Office specifically. Additional quality assurance will be provided by the UNDP Regional Technical Advisor as needed.

The project organisation structure is as follows:





Additional Information not well elaborated at PIF Stage:

**A.7 Benefits.** Describe the socioeconomic benefits to be delivered by the project at the national and local levels. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

One of the overall goals of the LDCF project will be to address vulnerability to climate change risks through contributing to national priorities identified under the UNFCCC. In doing so, the LDCF-financed project will also contribute to broader national objectives, such as addressing water scarcity, food insecurity, land degradation and poverty, particularly in the Tsilima Region. Resilience and adaptation in the agricultural and water sectors are key for Eritrea's adaptation pathway in general, and the Tsilima region is key for securing the country's food security, due to its importance as the country's breadbasket. Through these interventions, the LDCF resources will contribute towards the aims of the Millennium Development Goals of ensuring environmental sustainability (MDG 7) as identified at PIF stage, and several SDGs as identified at PPG stage (SDGs 2, 5, 6, 13 and 15). Outcome 2.3 of the project specifically addresses increased food production, directly contributing to SDG 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture). Outcome 3.1 contributes to SDG 5 (Achieve gender equality and empower all women and girls) through directed capacity building for equal participation and equitable sharing of benefits from the implementation of project interventions. Outcomes 1.2 and 2.2 directly contribute to SDG 6 (Ensure availability of and sustainable management of water and sanitation for all) by supporting implementation of Eritrea's Integrated Water Resources Management Action Plan. As a climate change adaptation project, the entire strategy is geared at combating the impacts of climate change, therefore contributing to the achievement of SDG 13 (Take urgent action to combat climate change and its impacts). The project also contributes to SDG 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss) through the implementation of climate- and ecosystem-smart watershed restoration and management through soil and water conservation measures at landscape level. The overall project strategy, by design, also contributes in direct and indirect ways to the achievements of SDG 1 (End Poverty in all its forms everywhere).

The emphasis of the project's activities on degraded ecosystems, with a particular focus on upstream watersheds, will result in the restoration and improved management of 9,000 hectares of land. Because local communities depend on natural resources for their livelihoods, improved environmental management will contribute to reducing food insecurity by promoting improved, and climate-smart agricultural production and overall maintenance of ecosystem goods and services that are central to rural livelihoods. Additionally, training communities to rehabilitate and manage ecosystems in a climate-smart manner will increase their resilience to climate shocks as well as improve their livelihoods through greater income-generating opportunities. The project will therefore contribute to reducing poverty in the Tsilima Region.

Additional national and local benefits are the enhanced capacities in planning and executing projects, undertaking M&E and empowering communities to take charge of their own livelihoods. The institutionalisation of improved, climate-smart approaches will also facilitate learning and increase potential for replication and upscaling in other parts of the country, as well as facilitate informed programming at the national planning levels. The immediate benefits of the project will be that government institutions, NGOs and vulnerable communities have increased knowledge and capacity to design and implement adaptation strategies as they: i) are more aware of the linkages between climate resilience and ecosystem management; and ii) acquire the necessary practical skills and tools to apply adaptation interventions. This increased capacity will also support long-term benefits by promoting CCA beyond the project implementation period. The improvement of the knowledge base applicable to the Tsilima Region will result in better decision-making and innovation in terms of agricultural production and an increase in agricultural productivity. In addition, application of new knowledge and adoption of new and improved climate-smart strategies and approaches will contribute to: i) improved agricultural/food production, leading to increased food security; ii) reduction in local communities' vulnerability to floods and droughts; iii) enhanced adaptive capacity of households and local communities; and iv) improved service delivery by government and non-government institutions through improved skills and knowledge. Without the project, local communities and the ecosystems upon which they depend will be increasingly at risk from the impacts of climate change and unsustainable land use and ecosystem exploitation and agricultural practices. Progress towards poverty reduction and socio-economic development will therefore be hampered.

**A.8 Knowledge Management.** Elaborate on the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives (e.g. participate in trainings, conferences, stakeholder exchanges, virtual networks, project twinning) and plans for the project to assess and document in a user-friendly form (e.g. lessons learned briefs, engaging websites, guidebooks based on experience) and share these experiences and expertise (e.g. participate in community of practices, organize seminars, trainings and conferences) with relevant stakeholders.

The project strategy includes an in-built component on Knowledge Management and Awareness-raising (Component 3) to specifically focus on knowledge management issues. The project will apply on-site planning and the development of appropriate climate change adaptation interventions. Therefore, knowledge will be generated together with farmers, user-groups, community-based organisations and local communities in the Kebabi Administrative Areas within the Tsilima Region. The project will specifically support and facilitate improved access to knowledge, and the development of guidelines and tools based on action research, field demonstration and the use of traditional and scientific knowledge in the design of response strategies. Local knowledge and experiences will therefore be documented and packaged in a manner that will be accessible for use by other users elsewhere. The project will also strengthen technical capacity at the local level, thereby contributing to increased capacity of extension services to deliver climate advice to farmers and land user. In addition, the project will improve knowledge management among targeted institutions and communities by:

- Developing climate-resilient land use and area development plans – through a participatory approach – for use by communities and KAA;
- Establishing multi-stakeholder forums for facilitating dialogue on CCA, food security and water resources management;
- Providing training to government, CBOs and local communities on appropriate CCA interventions;
- Developing training manuals targeting extension agents, farmers and CBOs;
- Developing awareness-raising materials – and disseminating these materials – on CCA in Zoba Debub and elsewhere in Eritrea; and
- Developing a participatory monitoring and evaluation system for CCA interventions that are implemented.

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• B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

B.1 *Consistency with National Priorities.* Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions such as NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.:

The project’s overall objective is to integrate adaptation measures into ecosystem restoration and agricultural production systems to address climate change in Eritrea and secure the benefits of the NFSS and IWRM Action Plan. By doing so, the LDCF-financed project will also support the implementation of Priorities 3, 4 and 5 of Eritrea’s NAPA. The project is in alignment with the following strategies and plans.

- One of the priorities of the **National Programme of Action (NAPA)** is to address groundwater recharge in Tsilima, where wells are drying up and groundwater supply for irrigation as well as for livestock and domestic use is limited. In alignment with the NAPA priorities, the project will enhance groundwater recharge and ensure easily accessible water supply through the: i) development of integrated water resources management; ii) implementation of on-farm and off-farm soil and water conservation measures; iii) implementation of groundwater monitoring; iv) contributions to food security and poverty reduction; and v) implementation of a sustainable strategy for coping with climate change. Furthermore, the project will encourage afforestation to facilitate restoration of degraded watersheds, control run-off and loss of arable land from soil erosion. In addition, individual households will be encouraged to plant trees for their own use, which will produce sustainable wood, fruit and fodder. Communities will also be assisted in implementing climate-resilient land use planning, ecological and agricultural interventions. And training will be provided to communities on the implementation of such interventions, including integrating tree planning and management in their farming systems through agro-forestry and silvopasture.
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- The LDCF-financed project is also aligned with the **First National Communication (FNC)** and the **Second National Communication (SNC)** through: i) promoting the efficient use of land resources by integrating climate risk considerations into land-use planning and decision-making; ii) empowering local communities with skills to maintain a balance between agricultural production and demands for non-agricultural land uses; iii) strengthening the community-based management of natural resources; and iv) addressing institutional and technical limitations. Furthermore, the project addresses several objectives identified within various national policies and strategies related to rural development, poverty alleviation and improved land management.
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- The LDCF-financed project is aligned with the **Interim Poverty Reduction Strategy Paper (I-PRSP)** and will support capacity building at the national and sub-national level for government departments, institutions and local communities. The project will therefore contribute to the overall objective of the I-PRSP to reduce poverty in Eritrea by creating favourable conditions for balanced and sustainable economic growth and improve the standard of living of its citizens.
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- The LDCF-financed project is also aligned with the **National Action Programme for Eritrea to Combat Desertification and Mitigate the Effects of Drought (NAP)** and will address climate change and land degradation through: i) strengthening the institutional capacity for land use planning; ii) developing community-based land-use and area development plans; iii) implementing agricultural and ecological interventions; and iv) reducing poverty through income-generating activities.
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- The **National Biodiversity Strategy Action Plan (NBSAP)** seeks to ensure the provision of ecosystem goods and services, as well as natural resources through the restoration, conservation and management of Eritrea's biodiversity. The project will support the enhancement of terrestrial biodiversity through the restoration of degraded watersheds and encouraging sustainable land, forestry and water resources management.
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- **Eritrea's Intended Nationally Determined Contributions (INDC)** sets out the countries commitments to address climate change through mitigation and adaptation, as well as steps to be taken in the implementation of projects, such as capacity building, the transfer of technology and M&E. Eritrea's adaptation contributions will address agricultural and forestry development, water resources and land resources development amongst others. The project will contribute towards achieving several of the intended adaptation goals for 2030, including: i) development and establishment of new enclosure areas; ii) promotion of climate-smart agriculture; iii) afforestation; iv) construction of new dams and ponds; v) rehabilitation of degraded land for agricultural purposes; vi) increase in agricultural – crop and livestock – productivity; and vii) implementation of sustainable land management practices.

As described in detail in the Partnerships section of the PRODOC (Section IV – Results and Partnerships), there are few GEF and non-GEF funded projects that focus on adaptation to climate change or sustainable land, forestry and water resources management are currently being implemented in Eritrea. Over the last decade, large-scale public soil and water conservation works and reforestation programmes have been implemented involving farm and community forestry. These programmes have resulted in the protection of ~305,000 hectares of land in enclosures throughout Eritrea. In conjunction with ongoing GEF and non-GEF funded projects, these initiatives provide opportunities for synergies and knowledge exchange with the LDCF-financed project. The Project Coordination Unit will coordinate efforts and establish linkages with other ongoing initiatives in the Tsilima region and elsewhere in Eritrea. This project will contribute significantly to bridging the gaps in communication and promote collaboration within and between different entities in government. While the MLWE is the lead Implementing Partner, it will work in close collaboration with the MoA and the MoTC (MSU) as the project's main focus is on watershed restoration for climate change adaptation within the food production sector. Horizontal linkages and collaboration will therefore be strengthened between these central government institutions for more integrated management of ecosystems and landscapes. Stronger linkages and collaboration will also be promoted between central and local government structures and institutions, in particular with the regional administration (i.e. Zoba and sub-Zoba levels). The project will strengthen local level structures such as resource-user associations and village committees and work with these as focal centers for delivery services, training, technical advice and local level consultations for decision-making and information with the wider community.

The partnerships to be formed between these different structures and entities are key to the delivery and achievement of project goals and objectives. The role of the Project Board and the Project Coordinating Unit in ensuring that the partnerships work and the interactions are kept functional is therefore key. UNDP, in its oversight role, and as both the Implementing Agency for this LDCF project and a development partner to the GoSE, will play a central role in ensure that these partnerships work, and will liaise at the highest level with government to ensure that the project delivers the development results as agreed between the GEF-LDCF, UNDP and the government.

### **C. DESCRIBE THE BUDGETED M&E PLAN:**

The project results as outlined in the project results framework will be monitored annually and evaluated periodically during project implementation to ensure the project effectively achieves these results. Supported by *Component Three: Knowledge Management and Awareness-Raising*, the project monitoring and evaluation plan will also facilitate learning and ensure knowledge is shared and widely disseminated to support the scaling up and replication of project results.

Project-level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in the [UNDP POPP and UNDP Evaluation Policy](#). While these UNDP requirements are not outlined in this document, the UNDP Country Office will work with the relevant project stakeholders to ensure UNDP M&E requirements are met in a timely fashion and to high quality standards. Additional mandatory GEF-specific M&E requirements (as outlined below) will be undertaken in accordance with the [GEF M&E policy](#) and other relevant GEF policies.

In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Report. This will include the exact role of project target groups and other stakeholders in project M&E activities including the GEF Operational Focal Point and national/regional institutes assigned to undertake project monitoring. The GEF Operational Focal Point will strive to ensure consistency in the approach taken to the GEF-specific M&E requirements (notably the GEF Tracking Tools) across all GEF-financed projects in the country. This could be achieved for example by using one national institute to complete the GEF Tracking Tools for all GEF-financed projects in the country, including projects supported by other GEF Agencies.

**M&E Oversight and monitoring responsibilities:**

Project Manager/Coordinator: The Project Manager/Coordinator is responsible for day-to-day project management and regular monitoring of project results and risks, including social and environmental risks. The Project Manager/Coordinator will ensure that all project staff maintain a high level of transparency, responsibility and accountability in M&E and reporting of project results. The Project Manager/Coordinator will inform the Project Board, the UNDP Country Office and the UNDP-GEF RTA of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted.

The Project Manager/Coordinator will develop annual work plans based on the multi-year work plan included in Annex A, including annual output targets to support the efficient implementation of the project. The Project Manager/Coordinator will ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for evidence-based reporting in the GEF PIR, and that the monitoring of risks and the various plans/strategies developed to support project implementation (e.g. gender strategy, KM strategy etc..) occur on a regular basis. In this role, the PM will also be technically supported by the Technical Advisor/Specialist (climate change adaptation) as indicated in the ToRs.

Project Board: The Project Board, also known as the Project Steering Committee, will take corrective action as needed to ensure the project achieves the desired results. The Project Board will hold project reviews to assess the performance of the project and appraise the Annual Work Plan for the following year. In the project's final year, the Project Board will hold an end-of-project review to capture lessons learned and discuss opportunities for scaling up and to highlight project results and lessons learned with relevant audiences. This final review meeting will also discuss the findings outlined in the project terminal evaluation report and the management response.

Project Implementing Partner: The Implementing Partner is responsible for providing any and all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary and appropriate. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes, and is aligned with national systems so that the data used by and generated by the project supports national systems.

UNDP Country Office: The UNDP Country Office will support the Project Manager/Coordinator as needed, including through annual supervision missions. The annual supervision missions will take place according to the schedule outlined in the annual work plan. Supervision mission reports will be circulated to the project team and Project Board within one month of the mission. The UNDP Country Office will initiate and organize key GEF M&E activities including the annual GEF PIR, the independent mid-term review and the independent terminal evaluation. The UNDP Country Office will also ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality.

The UNDP Country Office is responsible for complying with all UNDP project-level M&E requirements as outlined in the [UNDP POPP](#). This includes ensuring the UNDP Quality Assurance Assessment during implementation is undertaken annually; that annual targets at the output level are developed, and monitored and reported using UNDP corporate systems; the regular updating of the ATLAS risk log; and, the updating of the UNDP gender marker on an annual basis based on gender mainstreaming progress reported in the GEF PIR and the UNDP ROAR. Any quality concerns flagged during these M&E activities (e.g. annual GEF PIR quality assessment ratings) must be addressed by the UNDP Country Office and the Project Manager.

The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations undertaken by the UNDP Independent Evaluation Office (IEO) and/or the GEF Independent Evaluation Office (IEO).

UNDP-GEF Unit: Additional M&E and implementation quality assurance and troubleshooting support will be provided by the UNDP-GEF Regional Technical Advisor and the UNDP-GEF Directorate as needed.

**Audit:** The project will be audited according to UNDP Financial Regulations and Rules and applicable audit policies on NIM implemented projects.<sup>11</sup>

**Additional GEF monitoring and reporting requirements:**

**Inception Workshop and Report:** A project inception workshop will be held within two months after the project document has been signed by all relevant parties to, amongst others:

- a) Re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation;
- b) Discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms;
- c) Review the results framework and finalize the indicators, means of verification and monitoring plan;
- d) Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E; discuss the role of the GEF OFP in M&E;
- e) Update and review responsibilities for monitoring the various project plans and strategies, including the risk log; Environmental and Social Management Plan and other safeguard requirements; the gender strategy; the knowledge management strategy, and other relevant strategies;
- f) Review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; and
- g) Plan and schedule Project Board meetings and finalize the first year annual work plan.

The Project Manager/Coordinator will prepare the inception report no later than one month after the inception workshop. The inception report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Advisor, and will be approved by the Project Board.

**GEF Project Implementation Report (PIR):** The Project Manager/Coordinator, the UNDP Country Office, and the UNDP-GEF Regional Technical Advisor will provide objective input to the annual GEF PIR covering the reporting period July (previous year) to June (current year) for each year of project implementation. The Project Manager will ensure that the indicators included in the project results framework are monitored annually in advance of the PIR submission deadline so that progress can be reported in the PIR. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PIR.

The PIR submitted to the GEF will be shared with the Project Board. The UNDP Country Office will coordinate the input of the GEF Operational Focal Point and other stakeholders to the PIR as appropriate. The quality rating of the previous year's PIR will be used to inform the preparation of the subsequent PIR.

**Lessons learned and knowledge generation:** Results from the project will be disseminated within and beyond the project intervention area through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to the project. The project will identify, analyse and share lessons learned that might be beneficial to the design and implementation of similar projects and disseminate these lessons widely. There will be continuous information exchange between this project and other projects of similar focus in the same country, region and globally.

**GEF Focal Area Tracking Tools:** The following GEF Tracking Tool(s) will be used to monitor global environmental benefit results/adaptation benefits:

The baseline/CEO Endorsement GEF Focal Area Tracking Tool(s) – submitted in Annex D of the PRODOC (section XII – Mandatory Annexes) – will be updated by the Project Manager/Team and shared with the mid-term review consultants and terminal evaluation consultants (note the evaluation consultants hired to undertake the MTR or the TE) before the required review/evaluation missions take place. The updated GEF Tracking Tool(s) will be submitted to the GEF along with the completed Mid-term Review report and Terminal Evaluation report.

**Independent Mid-term Review (MTR):** An independent mid-term review process will begin after the second PIR has been submitted to the GEF, and the MTR report will be submitted to the GEF in the same year as the 3<sup>rd</sup> PIR. The MTR findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the MTR report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the [UNDP Evaluation Resource Center](https://info.undp.org/global/popp/frm/pages/financial-management-and-execution-modalities.aspx)

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<sup>11</sup> See guidance here: <https://info.undp.org/global/popp/frm/pages/financial-management-and-execution-modalities.aspx>

[\(ERC\)](#). As noted in this guidance, the evaluation will be ‘independent, impartial and rigorous’. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. The GEF Operational Focal Point and other stakeholders will be involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate. The final MTR report will be available in English and will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and approved by the Project Board.

**Terminal Evaluation (TE):** An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terminal evaluation process will begin three months before operational closure of the project allowing the evaluation mission to proceed while the project team is still in place, yet ensuring the project is close enough to completion for the evaluation team to reach conclusions on key aspects such as project sustainability. The Project Manager will remain on contract until the TE report and management response have been finalized. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the [UNDP Evaluation Resource Center](#). As noted in this guidance, the evaluation will be ‘independent, impartial and rigorous’. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. The GEF Operational Focal Point and other stakeholders will be involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate. The final TE report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the Project Board. The TE report will be publically available in English on the UNDP ERC.

The UNDP Country Office will include the planned project terminal evaluation in the UNDP Country Office evaluation plan, and will upload the final terminal evaluation report in English and the corresponding management response to the UNDP Evaluation Resource Centre (ERC). Once uploaded to the ERC, the UNDP IEO will undertake a quality assessment and validate the findings and ratings in the TE report, and rate the quality of the TE report. The UNDP IEO assessment report will be sent to the GEF IEO along with the project terminal evaluation report.

**Final Report:** The project’s terminal PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

**Mandatory GEF M&E Requirements and M&E Budget:**

GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget <sup>12</sup> (US\$)		Time frame
		GEF grant	Co-financing	
<b>Inception Workshop</b>	UNDP Country Office	USD 10,000		Within two months of project document signature
<b>Inception Report</b>	Project Manager	None	None	Within one month of inception workshop
<b>Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP</b>	UNDP Country Office	None	None	Quarterly, annually
<b>Monitoring of indicators in project results framework</b>	Project Manager /Coordinator		Per year: USD 4,000 (total \$20,000)	Annually
<b>GEF Project Implementation Report (PIR)</b>	Project Manager and UNDP Country Office and UNDP-GEF team	None	None	Annually
<b>NIM Audit as per UNDP audit policies</b>	UNDP Country Office	Per year: USD 3,000 (total \$15,000)		Annually or other frequency as per UNDP Audit policies

<sup>12</sup> Excluding project team staff time and UNDP staff time and travel expenses.  
GEF6 CEO Endorsement /Approval Template-Sept2015



GEF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget <sup>12</sup> (US\$)		Time frame
		GEF grant	Co-financing	
Lessons learned and knowledge generation	Project Manager	None		Annually
Monitoring of environmental and social risks, and corresponding management plans as relevant	Project Manager UNDP CO	None		On-going
Addressing environmental and social grievances	Project Manager UNDP Country Office BPPS as needed	None for time of project manager, and UNDP CO		
Project Board meetings	Project Board UNDP Country Office Project Manager			At minimum annually
Supervision missions	UNDP Country Office	None <sup>13</sup>		Annually
Oversight missions	UNDP-GEF team	None <sup>13</sup>		Troubleshooting as needed
Knowledge management as outlined in Outcome 3	Project Manager	USD 130,000	USD 170,000	On-going
GEF Secretariat learning missions/site visits	UNDP Country Office and Project Manager/Coordinator and UNDP-GEF team	None		To be determined.
Mid-term GEF Tracking Tool to be updated by (add name of national/regional institute if relevant)	Project Manager/ Coordinator	USD 5,000		Before mid-term review mission takes place.
Independent Mid-term Review (MTR) and management response	UNDP Country Office and Project team and UNDP-GEF team		USD 30,000	Between 2 <sup>nd</sup> and 3 <sup>rd</sup> PIR.
Terminal GEF Tracking Tool to be updated by (add name of national/regional institute if relevant)	Project Manager	USD 5,000		Before terminal evaluation mission takes place
Independent Terminal Evaluation (TE) included in UNDP evaluation plan, and management response	UNDP Country Office and Project team and UNDP-GEF team	USD 35,000		At least three months before operational closure
Translation of MTR and TE reports into English	N/A	None		
<b>TOTAL INDICATIVE COST</b> Excluding project team staff time, and UNDP staff and travel expenses		<b>\$200,000</b>	<b>\$220,000</b>	

### **PART III: CERTIFICATION BY GEF PARTNER AGENCY(IES)**

#### **A. GEF Agency(ies) certification**

**This request has been prepared in accordance with GEF policies<sup>14</sup> and procedures and meets the GEF criteria for CEO endorsement under GEF-6.**

Agency Coordinator, Agency Name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
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<sup>13</sup> The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GEF Agency Fee.

<sup>14</sup> GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF  
GEF6 CEO Endorsement /Approval Template-Sept2015

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## ANNEX A: PROJECT RESULTS FRAMEWORK

This project will contribute to the following Sustainable Development Goal (s): 1,2,5,6,13 and 15					
This project will contribute to the following country outcome included in the UNDAF/Country Programme Document: Eritrea is on track towards the achievement of MDG targets for environmental sustainability					
This project will be linked to the following output of the UNDP Strategic Plan: Output 1.4. Scaled up action on climate change adaptation and mitigation across sectors which is funded and implemented					
	Objective and Outcome Indicators	Baseline	Mid-term Target	End of Project Target	Assumptions
<b>Project Objective: To integrate adaptation measures into ecosystem restoration and agricultural production systems to address climate change in Eritrea and secure the benefits of the National Food Security Strategy and IWRM Action Plan.</b>	Indicator 1: Number of EbA and climate-smart agriculture measures integrated and budgeted into the government policies and programmes.	Current plans, strategies, policies, programs and budgets do not integrate climate resilience considerations	At least 1 policy framework includes adaptation measures and associated budgets	At least 2 policy frameworks (IWRM Action Plan and NFSS) include adaptation measures and associated budgets.	<p>The Eritrean government is fully committed to addressing the impacts of climate change, and both water and agriculture are central to the country's adaptation pathway. The Tsilima Plains are the most important bread basket for the country and the government is investing heavily in increasing agricultural yields from this area.</p> <p>All households in the target area are committed to participating in the project activities and taking-up/adopting climate resilient technologies and practices. Both government and farmers are committed to adopting climate resilient technologies and practices. Resilient technologies and practices will include climate smart agriculture, agro-forestry and soil and water conservation measures throughout the Tsilima Plains and Upper Catchment. A multi-stakeholder approach will be used to conduct assessments and develop land use plans that will guide climate-smart watershed restoration, agricultural production and livelihood practices.</p>
	Indicator 2: # of direct project beneficiaries (at least 60% women beneficiaries)	0	7,000 households	17,000 households	
	Indicator 3: Area of land under the adaptation practices (# of hectares)	0	4,500 hectares	9,000 hectares	

<p><b>Component 1</b></p> <p><b>Outcome 1.1: Capacity of research institutions to undertake climate related research increased</b></p> <p><b>Outcome 1.2: Capacity of extension service institutions to provide knowledge based climate smart extension service to agriculture, livestock production and water management increased</b></p>	<p>Indicator 4: Number of research products (e.g. toolkits, briefs and guidelines) on climate-smart agriculture developed</p>	0	2	4	<p>Trainees leave training with improved capacity. Staff will apply outcomes of climate-related research. Climate information and monitoring system established during this project will support climate-smart agriculture and production systems and the issuing of early warnings. Research products such as toolkits and guidelines on implementing climate-smart methods/approaches at farm-level will be based on scientific research (including on-farm research and demonstrations) undertaken by NARI. The Ministry of Agriculture is committed to improving the quality of agricultural extension and advisory services. Farmers have expressed concern at the lack of up-to-date information, skills and technologies to tackle the challenges presented by climate change and variability. Both government and farmers are therefore willing and committed to finding sustainable and climate resilient solutions. The role of research institutions (e.g. NARI) in finding locally-appropriate/relevant and evidence-based solutions to these challenges will therefore be key and an important aspect of the project support/ intervention.</p>
	<p>Indicator 5: Number of climate-resilient land use and area development plans developed and operationalised</p>	<p>Land use and area development plans have not been developed (0).</p>	<p>At least 1 climate-resilient land use and area development plan developed and operationalised</p>	<p>At least 3 climate-resilient land use and area development plans developed and operationalised.</p>	

<p><b>Component 2</b>  <b>Outcome 2.1: Climate-resilient land use planning implemented over 9,000 hectares of the Tsilima Region</b></p> <p><b>Outcome 2.2: Integrated water management operationalised across the Tsilima Region, increasing water availability and land under irrigation.</b></p> <p><b>Outcome 2.3: Increased food production through the implementation of climate-smart agricultural practices across the Tsilima Region.</b></p>	<p>Indicator 6: % increase in availability of water and area under irrigation.</p>	<p>28 m3 of water  1,352 hectares of irrigated land  Baseline to be verified during Year 1 of project implementation.</p>	<p>At least 15% increase  32 m3 of water  1,550 hectares of irrigated land</p>	<p>At least 30% increase  36 m3 of water  1,952 hectares of irrigated land  Target to be verified during Year 1 of project implementation.</p>	<p>Cost-effective water resource management measures will be identified and demonstrated/ promoted for use and uptake by farmers and other water users. Recommendations for IWRM Action Plan will be accepted and mainstreamed.  As part of the food security strategy, the farmers, community and government are committed to increasing food production and are willing to take up improved and climate resilient food/agricultural production practices and technologies. Risk and vulnerability assessments will be carried out and updated.</p>
	<p>Indicator 7: Improved score on the “Vulnerability and risk perception index” - disaggregated by gender.</p> <p><i>Vulnerability and Risk Assessment (VRA) to be conducted at 3 intervals: Year 1, 3 and 5 of the project.</i></p>	<p>1 - Baseline to be verified during Year 1 of project implementation</p>	<p>2 -Target to be verified during Year 1 of project implementation</p>	<p>3 - Target to be verified during Year 1 of project implementation.</p>	
<p><b>Component 3</b>  <b>Increased monitoring, knowledge-sharing and awareness at Zoba, Sub-Zoba and Kebabi levels on: i) climate change risks; ii) ecosystem-based adaptation; iii) the sustainability use and management of natural resources.</b></p>	<p>Indicator 8: % of targeted population awareness of predicted adverse impacts of climate change and appropriate responses (score) – disaggregated by gender.  1 = No awareness level (less than 50% correct)  2 = Moderate awareness level (50–75% correct)  3 = High awareness level (over 75% correct)</p> <p><i>The results of the survey will be extrapolated from the Vulnerability and Risk Assessment (VRA) to be conducted under Outcome 2.1</i></p>	<p>Baseline level of awareness in target population estimated at 1 (To be verified during Year 1 of project implementation)</p>	<p>Increased level of awareness in target population (1)</p>	<p>Increased level of awareness in target population from 1 (No awareness level) to 2 (Moderate awareness level)</p>	<p>Involvement in the design and implementation of project interventions and ongoing communication on the expected benefits of CSA and livestock production practices for local communities will result in long-term support of the project and adoption of new knowledge, skills and practices in food production and water management systems.</p>

**ANNEX B: RESPONSES TO PROJECT REVIEWS** (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

Comments received from Scientific and Technical Advisory Panel (dated 28 January 2016)	UNDP Responses to STAP comments
<p>1. Page 6 indicates the information on climate trends presented in the PIF was taken from an inception workshop in 2010, based on SRES scenarios. STAP suggests looking at the recent projections from the CMIP5 experiments, as assessed by the IPCC in the WGI contribution to the 5th assessment report. Also, UNDP could look at the information available from CORDEX on trends and projections for that region of Africa.</p>	<p>The downscaling of Global Circulation Models to finer spatial and temporal scales has received relatively limited attention in Africa. As a result, there is only one model and one emission scenario for regional climate simulations for the East Africa region (focusing on Kenya). The resolution is coarse (200km) and therefore the data can only be applied at the broad level, rather than the sub-regional level. To improve the certainty of the results, would require multiple regional models and emission scenarios. Notwithstanding the above, both the GCM and the regional models predict an increase in temperature and rainfall as discussed in further detail in Section II of the PD.</p>
<p>2. The PIF makes frequent reference to incorporating current and future climate-related risks into the baseline projects. While a necessary activity, it would be helpful to have more detail on how these risks will be identified, the sources of weather data and climate projections that will be used, from where those data and projections will be obtained, how it will be determined that forecasts and projections have sufficient skill, and how (and whom) will be trained to use weather and climate data. The table on page 18 indicates projections will be improved and updated, it would be helpful for the full proposal to provide more detail on how this will be achieved.</p>	<p>Eritrea has limited capacity to undertake climate modelling, prepare forecasts and issue early warnings because of a shortage of qualified meteorologists in the country. In addition, there is an absence of reliable climatic data to inform the development of accurate national climate change scenarios. The project will therefore contribute to the development of a national climate information and monitoring system which will monitor climate data and physical hazards. Moreover, the capacity of hydro-meteorological services and networks to predict extreme weather events – such as floods and droughts – will be enhanced. Data from the national climate information and monitoring system will be collected by various stakeholders and analysed by the Meteorological Services Unit (MSU), which is responsible for transmitting warnings to the local communities. Up-to-date climate change predictions will also be incorporated into ongoing development planning. Training will be provided on meteorological observation and analysis to MSU and other stakeholders, however, reliance will still be placed on regional (e.g. Greater Horn of Africa Climate Outlook Forum) and international institutions (World Meteorological Organisation) for downscaling, climate modelling and climate change simulations during the project implementation period. As described under Output 1.1.4, a capacity development program will be developed and implemented to address gaps in skills, training, equipment and facilities particularly targeting the Meteorological Services Unit (MSU). A training program will also be put in place for the MSU and other relevant stakeholders, focusing specifically on meteorological observation and analysis.</p>
<p>3. It would also be helpful to include consideration of the extent to which proposed activities could be resilient to a range of possible future climate and development scenarios. While reducing current vulnerability to climate variability is very important, activities should also consider what a changing climate could mean for particular practices as temperature and precipitation patterns change. UNDP could consider developing regional scenarios emission pathways (RCPs) and shared socioeconomic pathways (SSPs) that can inform identifying adaptation options robust against a range of future climates and societal changes. Further information on the development of</p>	<p>As previously discussed, there is little downscaling of Global Circulation Models to finer spatial and temporal scales in Africa and only one model and one emission scenario for regional climate simulations for the East Africa region (focusing on Kenya). Furthermore, there is currently limited information available in Eritrea which would assist in the development of regional scenarios emission pathways and socioeconomic pathways. In this context, the project will implement a long-term monitoring and evaluation strategy which will assist in determining the effectiveness and resilience of the proposed activities. At present, there are few climate change adaptation</p>

<p>these new climate scenarios can be found at <a href="http://www2.cgd.ucar.edu/research/iconics">http://www2.cgd.ucar.edu/research/iconics</a></p>	<p>interventions being implemented in Eritrea and consequently limited demonstration of the resilience of such activities within the local context. The project will therefore rely upon traditional and scientific knowledge to identify appropriate climate-smart agricultural practices – including best practices that have proven successful in similar biophysical and climatological conditions in East Africa and elsewhere. As part of the Greater Horn of Africa region, Eritrea relies heavily on rain-fed agriculture and livestock production. There is therefore increased need for improved linkages and interactions between climate and agriculture/livestock/food security sectors and experts. The focus of this project is to facilitate these linkages, particularly through the factoring of climate information and early warning products in national agriculture and livestock management policies and water management policies and strategies. This will be facilitated through support to closer collaboration and information sharing and interactions between the National Agricultural Research Institute (NARI), the Meteorological Services Unit (MSU), the Water Resources Department (WRD) and the Ministry of Agriculture. Outcome 1.1. addresses several aspects of this.</p>
<p>4. STAP recommends the full proposal include more information on how various agricultural and livestock production technologies will be chosen and how they will be determined to be resilient to current and future climate change, including the criteria that will be applied and the indicators that will be used for monitoring and evaluation.</p>	<p>Currently, there are few climate change adaptation interventions being implemented in Eritrea. As a result, the resilience and benefits of such interventions has not been sufficiently demonstrated to policy- and decision-makers. Without sufficient demonstration, it is unlikely that climate change adaptation interventions will be mainstreamed or that local communities will adopt such interventions. Climate-risk information will inform decision-making on land-use planning and climate-smart agricultural practices. Land capability classifications, including soil surveys and chemical analysis will be undertaken to inform the selection of climate-smart agricultural practices. The project will rely upon both traditional and scientific knowledge and will implement proven and context relevant climate-smart agricultural best practices. In addition, the hydro-meteorological information and groundwater assessments (under Outcome 2.2) will support the mapping of drought and flood prone areas. Based upon the information and maps generated, climate-resilient land use plans will be developed in collaboration with the local communities. Under Component 1, the project will undertake research to better understand the impacts of climate change and how ecosystem degradation may aggravate the effects thereof. Research and other institutions will be actively involved in studies determining the effectiveness of the project’s climate-smart agricultural practices and watershed restoration measures. Participatory monitoring and evaluation is therefore integral to the success of the project and continued learning and uptake of best practices that the project will generate. A cost-benefit analysis of the agricultural and ecological interventions will also be undertaken to measure the impacts and analyse the effectiveness of such interventions. (Refer to Section A.1 of the CEO ER and Section IV of the PD – Components 1 &amp; 2).</p>
<p>5. Table 18 indicates there will be learning-by-doing component for iterative management; it would be helpful for the full proposal to provide more detail on how this will be achieved.</p>	<p>There is a dedicated research component (with NARI) under Component 1. The work to be conducted by NARI will support significant action research and on-farm demonstrations with active involvement of farmers to test different climate-smart</p>

	<p>technologies and approaches and this research will inform further climate-smart research and technology development by NARI. The results and learning from this iterative research process will inform national level strategies and interventions, particularly the support programs by the Agricultural Extension Division of the Ministry of Agriculture. In addition, there is a separate knowledge management and awareness component (Component 3) through which support will be provided to facilitate information and knowledge-sharing by different stakeholders across sectors, including between and among land-users, and between land-users and land managers about what approaches and technologies work and don't work to facilitate continuous improvement of response mechanisms. Component 3 also includes a specific gender strategy to better integrate women's views and experiences into the development of response strategies and consideration of the differentiated impacts of climate change on men and women.</p>
<p>6.STAP suggests including the Ministry of Health, the WHO country office, and other health systems organizations as key stakeholders, to ensure that activities such as installing microdams and small water storage facilities do not also increase breeding grounds for vectors of infectious diseases, as has happened in other regions.</p>	<p>This is addressed and integrated into Output 1.1.4 (with linkages to Output 2.2.2.) as part of the focus of the Early Warning System (EWS) to be established. According to the NAPA, the INDC and the Eritrea WHO Country Cooperation Strategy, there has been an increase in the incidence of malaria and Dengue Fever in the highlands, a situation never observed before. UNDP will therefore work closely with WHO (under the ONE UN framework) in its implementation of the national level strategies that focus on supporting the government in its prevention of malaria occurrence. The current situational analysis reveals that immunization and protection against malaria are well accepted in Eritrea, as evidenced by the proportion of fully-immunized children, estimated at 95% (EPI Coverage Survey 2013), while 60.1% of women aged 15–49 years and 67.4% of children under the age of five years sleep under ITN (Malaria Indicator Survey, 2012). The project's close collaboration with the NUEW (National Union of Eritrean Women) and NUEY (National Union of Eritrean Youth and Students), which WHO also work closely with, present good opportunities for increased sharing of information on community-level issues. The incidence of diseases will also form an integral part of the Early Warning System to be developed by the project.</p>
<p>7.It would be helpful for the full proposal to more fully describe the training components of the proposed project.</p>	<p>Training and capacity building are key components of the entire project strategy as it forms an important aspect of building climate change adaptation capacity within the country. Section A1 (Project Description) of the CEO ER unpacks the capacity challenges in Eritrea and identifies systematic lack of capacity as one of the key barriers to adaptation in the country at all levels. As outlined under section III (Strategy) of the PRODOC, training will strengthen the technical capacity of government staff at local and national levels to analyse, predict and respond to climate change effects, access policy-relevant data and deliver relevant information to local communities. Due to limited capacity in Eritrea in the field of climate change and integrated natural resources management in general, as fully outlined in the country's NAPA and also highlighted in the INDC, training and capacity building will take many forms at different levels of society. For instance, training will be conducted at community</p>

	<p>levels to increase skills and awareness on climate-smart agriculture, including technologies. At government institution level, technical training will be offered to agricultural extension officers, water resource technicians, meteorologists and even scientific and academic researchers at the National Agricultural Research Institute (NARI) to carry out their mandates and ensure that science and data inform the sectoral strategies of these institutions.</p>
<p>8.STAP suggests including in the full proposal an assessment of the energy intensity of the “appropriate technologies employing modern agricultural inputs”. It would also be helpful to assess the potential impacts of those technologies on ecosystem services. Further, STAP would appreciate understanding how technologies will be determined to be appropriate.</p>	<p>Eritrea is a least developed country, with ~65% of the population living in rural areas who are primarily dependent upon subsistence rain-fed agriculture. In 2010, Eritrea was responsible for less than 0.01% of the global GHG emissions. Agricultural inputs and mechanised agricultural practices are not widely used in Eritrea and the agriculture sector is therefore not considered energy intensive. Notwithstanding the above, the project promotes climate-smart agricultural practices including zero tillage and the use of organic fertilizers (such as livestock manure) which are not energy intensive. Where required, the project will promote low-carbon technologies, particularly in the development of small-scale irrigation initiatives. Alternative options that will be explored in further detail include gravity-fed irrigation schemes and solar-powered boreholes and pumps.</p> <p>Currently, there is limited knowledge and awareness of the role of ecosystems across Eritrea in reducing the negative effects of climate change. Ecosystem degradation resulting from unsustainable resource use by local communities is partly a result of limited knowledge (including scientific knowledge) of the benefits of maintaining functional ecosystems. Furthermore, there are few climate change adaptation interventions being implemented in Eritrea. As a result, the impacts of such interventions have not been sufficiently demonstrated or analysed. With regards to the positive impacts of the technologies proposed, an evaluation of soil and water conservation projects by the World Food Programme is evidence of the off-site benefits of such measures. Such benefits include: i) increased groundwater recharge; ii) reduced formation of gullies; iii) reduced sedimentation of downstream irrigation dams; iv) reduced flooding; and v) increased biodiversity. The potential negative impacts of project activities have been mitigated against through the inclusion of proactive measures. For example, the design and location of water storage and harvesting measures will be informed by EIAs, groundwater and surface water assessments, while soil and water conservation measures will be informed by the mapping of drought and flood prone areas to ensure that relevant measures are implemented in the appropriate location to divert or capture water and prevent soil erosion etc. In addition, the practice of tree-enclosures has been widely adopted by farmers but often exotic species (e.g. Eucalyptus) are preferred over indigenous species. Even where the impacts of exotic species are understood by some officials and practitioners, the short-term gains – e.g. Eucalyptus grows faster and provides better timber than most indigenous species – outweigh longer-term environmental impacts. Currently, the trade-offs between timber production and watershed rehabilitation are not widely understood. The project will therefore promote the use of a mix</p>

	<p>of indigenous and exotic species. However, future reforestation programmes and the implementation of the baselines projects elsewhere in Eritrea will benefit from – and be informed by – cost-benefit analysis to be undertaken as part of the project’s monitoring and evaluation programme. (Refer to Section A.1 of the CEO ER and Section IV of the PD – Component 2).</p>
<p>9.STAP recommends including more descriptions of, including criteria, for determining how climate research will be decided to be “innovative and strategic”, what are the components of a “holistic analysis of resilience”, what are the components of an “integrated approach to adaptation” and similar phrases that refer to processes and methods where additional clarity would be helpful.</p>	<ul style="list-style-type: none"> <li>• Under Outcome 1, the project will support NARI – in conjunction with other academic and research institutions – to undertake innovative and strategic climate-related agricultural research, which will improve climate risk management in Eritrea. The shortage of skilled personnel within research institutions and extension services, compounded by the limited availability of information, basic equipment and facilities is a constraint on agricultural development and growth. Food security in Eritrea, particularly in rain-fed agriculture therefore requires the reorientation of research and extension services to support smallholders in boosting their agricultural productivity. Since research is already limited in Eritrea, whatever research is conducted must be strategic and responsive to the country’s needs, and particularly inform strategies and responses to the critical sectors in the country, and these include water resources development and management and the agricultural production sectors. For example, research into climate-smart agriculture could contribute to increased agricultural productivity by developing drought-tolerant and short-maturing crops, while increasing the resilience of the sector against the impacts of climate change. The results of such research will include inter alia: i) assessments on climate-smart agriculture including useful and climate-resilient species under Outcome 1.1; and ii) groundwater and surface water assessments under Outcome 2.2. Consequently, the results will be used to provide knowledge-based advice to the extension services; as well as inform and strengthen the evidence base for climate change adaptation interventions in Eritrea – including the design of future climate change adaptation interventions. The knowledge generated will also promote the sustainability of project interventions. (Section A.1 of the CEO ER and Section IV of the PD – Outcomes 1.1 and 1.2)</li> <li>• Climate-risk information will inform decision-making on land-use planning and climate-smart agricultural practices (under Outcome 2.1). In addition, hydro-meteorological information and groundwater assessments will support the mapping of drought and flood prone areas. The community-based climate-resilient land use and area development plans will therefore be based upon the information and maps generated through water assessments, land capability and soil surveys, as well as community input. Taking into account all of the available physical and biophysical information, these maps will identify those areas that will be threatened by extreme weather events under changing climate conditions (Section A.1 of the CEO ER and Section IV of the PD).</li> <li>• In addition to technical and scientific assessments to be conducted by the various sectors, societal level analysis of climate change vulnerability and risk will also be conducted through the use of the Vulnerability and Risk Assessment (VRA) tool. This assessment will inform the key elements of a</li> </ul>



	<p>community-based adaptation programme. This is described in detail under Output 2.1.2 of the project strategy and results framework.</p> <ul style="list-style-type: none"> <li>The project will adopt an integrated approach to climate change adaptation at the watershed level within Eritrea. Such an approach would: i) reduce the rate of agricultural expansion into marginal lands; ii) reduce the rate of watershed degradation; and ii) safeguard the productivity of existing agricultural areas and the availability of natural resources at the watershed level under conditions of climate change. The emphasis of the project's activities on degraded ecosystems, with a particular focus on upstream river areas, will result in the restoration and improved management of 9,000 hectares of land. Because local communities depend on natural resources for their livelihoods, improved environmental management will reduce poverty and increase food security. Additionally, training communities to rehabilitate and manage ecosystems in a climate-smart manner will increase their resilience to climate shocks as well as improve their livelihoods through greater income-generating opportunities. (Section A.1 of the CEO ER and Section II of the PD).</li> </ul>
<p>10. STAP would be interested in understanding how diversion structures would be designed to capture more water during flash floods.</p>	<p>Outcome 2 of the project makes provision for comprehensive baseline assessments and monitoring of water resources. The information generated thereby will be used in the design of measures for the capture, storage and distribution of water. During year one of project implementation, engineers will be appointed to work closely with the Water Resources Department to undertake studies regarding the site selection and design of watershed restoration and management measures, including diversion structures. Criteria that will be taken into consideration in the design of such measures will include the likely increase in frequency and severity of droughts and floods under climate change. For example, the size of diversion weirs, intake facilities and conveyance canals as well as the height and width of earth embankments will be designed in accordance with the 50-100 year flood levels. Sediment-excluding facilities may also be included to handle the potential increase in debris (Section A.1 of the CEO ER and Section IV of the PD).</p>
<p>11. It would be helpful in the full proposal to have a more detailed description of the lessons learned in the GEF SLM tenure security project and how those will be applied in the proposed project.</p>	<p>As described in detail under section Part II: Project Justification of the PIF - A. <i>Describe any changes in alignment with the project design with the original PIF</i> - the project will make significant contribution to informing the process of land redistribution through 2.1.3 (<i>Technical support provided to the Zoba and sub-Zoba administration to inform implementation of the land redistribution process through the:</i> i) <i>classification of land according to potential land uses; ii) mapping of coordinates; and iii) assessment of the availability and quality of resources (e.g. soil and water)</i> by conducting land classifications and mapping, as well as resource assessments in line with the requirements of the Land Proclamation as discussed in detail under Outcome 2.1. The lack of capacity (skills, equipment and manpower) to conduct land classifications, mapping of coordinates and resource assessments, has been identified as the primary barrier to implementing the 1994 Land Proclamation. The results of the work to be conducted under this output will, therefore, provide</p>

	<p>the scientific basis for land allocation decisions to be taken by the government, and unlock the process of implementing the land redistribution policy. The land use plans to be developed under this component will therefore have a long-term impact on government's land reform process and contribute, albeit indirectly, to the incentives for SLM investments.</p> <p>The project will not directly implement the land distribution process as initially planned, and as successfully piloted under the Sustainable Land Management Pilot Project (UNDP ID: 2979; GEF ID: 3364) but will contribute significantly to the process of land redistribution (through several land and resource assessments as described above). A major lesson from the SLM project is that Eritreans see great value in secure land tenure and recognise it's a key element for increased SLM investments for both agricultural production and ecosystem management. Another key lesson for the government is that redistributing land will require significant resources to fully understand the state of the land resources (quantity and quality) and use of scientific information to facilitate decisions for land allocations. This change in approach was specifically requested by the government during the PPG process.</p>
<p>12.STAP appreciates the intentions to increase gender equity through the project, and encourages UNDP to integrate gender aspects throughout the project and not just as stand-alone activity. It would be interesting to understand in the full proposal how climate change threatens to increase inequality in Eritrea (page 7 of the PIF).</p>	<p>While there's a standalone component (Component 3) focusing on developing a gender strategy, gender has been integrated throughout the entire project strategy. This has been done through systematic recognition of the differentiated impacts of climate change and natural resource governance issues in the elaboration of the problem/development challenge (see section A4 of the CEO ER and section III of the PRODOC (Strategy – discussion on National and Local Benefits)). Detailed information and analysis of the gender issues around climate change and natural resources management are outlined in the Baseline Study Report (Annex M of the UNDP PRODOC).</p> <p>As outlined in the CEO ER and PRODOC, 17,000 households (57% of which are female-headed) in the project area will benefit from project interventions. The project specifically targets 60% women out of these 17,000 households. During project implementation, the project will engage a Gender Specialist to work closely with the National Union of Eritrean Women (NUEW) to develop a Gender Strategy and work with other technical experts to be contracted by the project to ensure that gender issues are mainstreamed into all aspects of the project, including training manuals, strategies, action plans and assessments. One key assessments will inform the Gender Strategy as well as implementation of the project interventions. This is the Vulnerability and Risk Assessment which will not only assess the perception of climate-related risk and vulnerability by men and women in the project area, but will also gauge the overall level of awareness on climate change and its potential impacts. This will therefore inform the design of sector-specific adaptation responses (in response to the gender differentiated impacts of climate change) and also inform the design of awareness, communication and knowledge management aspects of the project, with a focus on increasing both capacity to adapt but also knowledge and awareness on climate change issues in general.</p>

	<p>The project has prepared a guidance for gender-sensitive and gender-responsive project implementation which will be refined during the first year of implementation (see Annex O of the PRODOC).</p>
<p>13. Note that the PIF is inconsistent on current levels of capacity in the scientific community, with statements saying capacity needs to be increased and the table on page 17 indicating there is sufficient capacity to undertake a wide range of activities from evaluating uncertainties to supporting policy design.</p>	<p>Capacity constraints in general, and in the field of climate change adaptation in particular are significantly limited in Eritrea. This is well articulated in the country's NAPA, INDC and other key national documents, and was confirmed during the PPG (<i>by applying the UNDP Capacity Development Scorecard</i>). The results of baseline studies revealed that capacity is lacking in terms of qualified human resources, finances and facilities, and this is a challenge across the board, including at the national level within government technical institutions. This is the case even within institutions tasked with generating science and knowledge to inform policy and practice. At the local level, there is significant illiteracy among farmers and land users, and the capacity and skills of agricultural extension officers is also limited to inform improved land use practices at the local, and in particular for mainstreaming climate risk in land use and management. In addition, Eritrea has limited to non-existent partnerships with external institutions that could promote knowledge exchange and exposure to modern scientific knowledge and tools to inform policy and practice.</p> <p>As a result of these capacity limitations, the project will focus significantly on capacity building to undertake research, conduct assessments to inform strategy development, interventions as well as policy formulation and implementation. Capacity of resource users and managers will also be supported to promote knowledge-based agricultural production and ecosystem management.</p>
<p>14. STAP suggest including an output to plan for scaling up.</p>	<p>Monitoring, evaluation and scaling up are key parts of the project strategy and have therefore been integrated into the project design in each of the project outputs. In addition to this, a specific output relating to scaling up has been included in Component 3 (Knowledge Management and Awareness-raising), Output 3.1.3: A strategy developed and implemented for: i) scaling up lessons learned to other zobas, sub-zobas and kebabis; and ii) informing decision-making at national level. Under this output, lessons learned (during project implementation) and best practices will be shared through the information sharing platform to inform policy- and decision-makers, as well as inform the implementation of baseline projects in other regions of Eritrea. In addition, a strategy will be developed for scaling up and replicating project activities and lessons learned throughout Eritrea. (Section A.1 of the CEO ER and Section IV of the PD).</p>
<p>15. As articulated in the PIF, the large numbers of baseline projects mean close coordination will be necessary. Providing further details in the full proposal would be appreciated.</p>	<p>The coordination between this LDCF project and on-going GEF and non-GEF initiatives in the country is described in section B1 - <i>Consistency with National Priorities</i> of the CEO. Full details of this coordination, and which projects the LDCF project will work closely with and learn from, is described in detail in the Results and Partnerships (Section IV) of the PRODOC under the 'Partnerships' sub-section.</p>

**ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS<sup>15</sup>**

A. Provide detailed funding amount of the PPG activities financing status in the table below:

<b>PPG Grant Approved at PIF: 100,000</b>			
<i>Project Preparation Activities Implemented</i>	<i>GEF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
Component A - Technical review	84,000	35,396.14	48,603.86
Component B - Institutional arrangements, monitoring and evaluation	2500	3,446.70	(946.70)
Component C - Financial planning and co-financing investments	2000	3,012.95	(1,012.95)
Component D - Validation workshop	2000	1,721.49	278.51
<b>Total</b>	<b>90,500</b>	<b>43,577.28</b>	<b>46,922.72</b>

<sup>15</sup> If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue to undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities. Agencies should also report closing of PPG to Trustee in its Quarterly Report.

**ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF Trust Funds or to your Agency (and/or revolving fund that will be set up)

N/A