REQUEST FOR CEO ENDORSEMENT
PROJECT TYPE: FULL-SIZED PROJECT
TYPE OF TRUST FUND: LDCF

PART I: PROJECT INFORMATION

Project Title: Building Adaptive Capacity to Catalyze Active Public and Private Sector Participation to manage the Exposure and Sensitivity of Water Supply Services to Climate Change			
Country(ies):	Sierra Leone	**GEF Project ID:**[1]	4599
GEF Agency(ies):	UNDP (select) (select)	**GEF Agency Project ID:**	4613
Other Executing Partner(s):	Ministry of Water Resource	**Submission Date:** **Resubmission Date:**	July 2, 2013 November 11, 2013
GEF Focal Area (s):	Climate Change	**Project Duration (Months)**	48
Name of Parent Program (if applicable):	n/a	**Agency Fee ($):**	294,000

A. FOCAL AREA STRATEGY FRAMEWORK[2]

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount ($)	Co-financing ($)
CCA-1	Outcome 1.1: Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas	Output 1.1.1: Adaptation measures and necessary budget allocations included in relevant framework	LDCF	700,000	3,200,000
CCA-2	Outcome 2.2 Strengthened adaptive capacity to reduce risks to climate-induced economic losses	Output 2.2.2: Targeted population groups covered by adequate risk reduction measures	LDCF	1,000,000	3,450,000
CCA-3	Outcome 3.2 Enhanced enabling environment to support adaptation-related technology transfer	Output 3.2.1 Skills increased for relevant individuals in transfer of adaptation technology	LDCF	1,100,000	3,000,000
Subtotal				2,800,000	9,650,000
Project management Cost (PMC)[3]				140,000	500,000
Total project costs				2,940,000	10,150,000

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area/LDCF/SCCF Results Framework when completing Table A.
[3] PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

B. PROJECT FRAMEWORK

Project Objective: Enhancing adaptive capacity of decision-makers in the public and private sector involved in water provision to plan for and respond to climate change risks on water resources						
Project Component	**Grant Type**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Grant Amount ($)**	**Confirmed Co-financing ($)**
Component 1: Integrating climate change considerations into water policie	TA	OUTCOME 1: Critical public policies governing the management of water resources revised to incentivize climate smart investment by the private sector	**Output 1.a:** More than 50 officers from the Ministry of Water Resources, esp. the Water Policy Planning Coordinating Unit (WPPCU), the Sierra Leone Environmental Protection Agency (EPA) and Districts leaders provided with relevant climate risks management guidelines/tools and trained on how the results of the climate risk/vulnerability assessments should be used to adjust regulations and policies governing the water sector at national (NWSP, RWSS) and local level (Districts development plans) **Output 1.b:** Climate change resilience plan and emergency contingency plan for the Guma Reservoir **Output 1.c:** Regular dialogues established between parliamentarians, local council members, traditional authorities, NGOs/CBOs, and private sector (WASH committees) on the impacts of climate change on water supply in Puhejun, Kambia and Kono districts **Output 1.d:** At least two dialogues under the Sierra Leone Business Forum and WASH Donors Investment Platform initiated on managing climate change risks on water provision and usage **Output 1.e:** Relevant experiences/lessons from community oriented climate resilient water infrastructure and management practices (including gender differentiated issues)	LDCF	700,000	3,200,000

Project Objective: Enhancing adaptive capacity of decision-makers in the public and private sector involved in water provision to plan for and respond to climate change risks on water resources						
Project Component	**Grant Type**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Grant Amount ($)**	**Confirmed Co-financing ($)**
			identified, and widely shared/disseminated to facilitate replication in other vulnerable areas			
Component 2: Strenghtening the resilience of water supply systems to anticipated climate change risks	TA	OUTCOME 2: Water supply infrastructure in Freetown and Puhejun, Kambia and Kono districts made resilient against climate change induced risks	**Output 2.a:** Pilot demonstrations of innovative climate resilient rainwater collection in at least 3 public building with reservoirs established to support the bottleneck of drink water supply in the dry season **Output 2.b:** Spring water improvement designed, tested and demonstrated in high density area in Freetown (benefiting at least 200 households) **Output 2.c:** Sustainable community reservoirs with 9 stand-alone roof-top rainwater harvesting systems (in 3 hospitals and 6 schools), as well as 5 resilient gravity fed water distribution systems designed and pioneered in Kono, Kambia and Pujehun **Output 2.d:** At least 100 households provided with water storage and treatment systems for drinking water usage in times of prolonged dry-spells and drought in Kono, Kambia and Pujehun	LDCF	2,100,00	6,450,000
Subtotal				LDCF	2,800,000	9,650,000
Project management Cost (PMC)[4]				LDCF	140,000	500,000
Total project costs					2,940,000	10,150,000

C. OF CONFIRMED CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Please include letters confirming co-financing for the project with this form

[4] PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	Co-financing Amount ($)
National Government	Government of Sierra Leone	In-kind	500,000
National Government	Government of Sierra Leone	Grant	8,500,000
GEF Agency	UNDP	Grant	1,150,000
Total Co-financing			10,150,000

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

GEF Agency	Type of Trust Fund	Focal Area	Country Name/ Global	(in $)		
				Grant Amount (a)	Agency Fee (b)[2]	Total c=a+b
UNDP	LDCF	Climate Change	Sierra Leone	2,940,000	294,000	3,234,000
Total Grant Resources				2,940,000	294,000	3,234,000

[1]

E. **CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:**

Component	Grant Amount ($)	Co-financing ($)	Project Total ($)
International Consultants	268,800	36,000	304,800
National/Local Consultants	459,800	88,600	548,400

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? No

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

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[5]

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc. **N**

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities. **N/A**

A.3 The GEF Agency's comparative advantage:

The Project is linked with the current UNDP Country Programme 2013-2014 (http://www.undp.org/content/sierraleone/en/home/operations/legal_framework/) that address natural resource management issues through capacity enhancement for improved environmental governance. UNDP also supports the development and implementation of a national disaster risk management strategy (including

[5] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF
stage, then no need to respond, please enter "NA" after the respective question

climate change risk) and the integration of disaster risk reduction and climate change into planning and budgeting processes.

The project furthermore feeds into two environment related Outcomes of the new UNDAF 2014-2018 (**Outcome 1:** By 2018, targeted Government institutions, the private sector, and local communities manage natural resources in a more equitable and sustainable way; **Outcome 2:** By 2018, targeted communities demonstrate decreased vulnerability and increased resilience to natural and man-made disasters.

The UNDP Sierra Leone Country Office is well resourced to provide the necessary support to the GoSL in implementing this LDCF funded project. The UNCP CO, with the support of expertize in the UNDP-GEF team, will assist the Government through the unit in charge of Environment. Staff working with national and local partners on programming and projects related to sustainable management of natural resources, and climate change (especially those focused on adaptation) will be mobilized to support the Govt with this project In particular, a Head of Unit (P4), two national professionals and one UNV (one more expected to arrive in 1st Quarter of 2014) will provide technical and policy support. The team is currently focused in supporting the Government in following key areas: 1) assistance to the international climate negotiations; 2) capacity building to access and implement climate finance; and 3) effectively integrating climate change into a country's national plans, policies and strategies to ensure development is both low-emission and climate resilient. Other management support services will also be provided based on need including on procurement & finance services.

A.4. The baseline project and the problem that it seeks to address:

Climate changes and vulnerability of the water sector

Report of studies relating to climate change and National Adaptation Programme of Action carried out in recent times as well as NAPA regional workshop reports have revealed that rainfall and temperature patterns of the country have been changing. Forecasted climatic changes are detailed in paragraphs 13-15 of the UNDP Project Document. The climate models (HADCM2, UKTR, CSIRO, ECHAM and UKMOEQ) indicate a steady increase in temperature for Sierra Leone with little inter-model variance. With regards to rainfall an increase or decrease under climate change scenario is a critical factor in estimating how climate change will affect Sierra Leone, given the country's extreme vulnerability to water related problems. Various General Circulation Models (GCMs) have been used in developing climate change scenarios for Sierra Leone. The models predict an increase in temperature of about 5 °C by 2100. The increase in temperature will increase the amount and intensity of precipitation. An increase in rainfall could lead to an increase in surface runoff, resulting in flooding. On the other hand a decrease in the amount and intensity of rainfall may lead to drought. Climatic risks pose a serious challenge to Sierra Leone's water sector, a sector that already faces several challenges.

By far the highest vulnerability is the current infrastructure, which still is lacking or very poor and is only now being rehabilitated and has been impacted as a result of the war. Most communities rely on surface water, which has implications in terms of water-borne diseases. Already, a large percentage of the population has no access to clean water. It is projected that this will be further exacerbated by climate change, especially during prolonged dry spells. Major water uses include domestic (drinking, cooking, hygiene), agriculture (irrigation), industrial (beer, spirits, soft drink, cooling and waste disposal), and energy production (hydroelectrical power production). Migration of the rural population to the capital, Freetown, during the civil conflict has put considerable pressure on the water demand.

Shifting rainfall has created water supply problems resulting in the decrease to consumers, reduced stream flow of rivers and streams and also health related problems associated with the outbreak of water borne disease. For example, following the drop in rainfall since 1970s, the flows of major rivers has fallen significantly. The stream flow to the Manu River fell by 30% between 1971 and 1989.

The fact that 90% of Freetown's population depends on one water source, the Guma Valley reservoir, puts immense pressure on the source. The Guma Valley Water Company, the company responsible for water provision, has a severely weak monitoring system in place and a virtually non-existing risk management or contingency plan i.e. related to climate risks. In 2006, the water level fell way below the intake level causing a major water shortage in the city. On the other hand, during intense rainy seasons, the reservoir is at full capacity – leaving it highly vulnerable to overflow. Either one of these situations causes immense vulnerability to the city's inhabitants, and with no Early Warning System, or effective monitoring in place, elevates the vulnerability even more so.

Increased flooding could cause serious problems, such as pollution of ground water and destruction of current water-related infrastructure. Long dry spells in north and western areas of the country have already disrupted water supply resulting in negative health impacts. As water resources become scarce and competition for water increases, polluted water may be used for drinking and bathing, and this spreads infectious diseases such as typhoid, cholera and gastroenteritis. These diseases particularly affect the urban poor. Moreover, decreased availability of water for irrigation food production heightens the risk of poor nutrition and increased susceptibility to disease.

The vulnerability of ecosystems and forest formation to protect watersheds will depend on rainfall variability modulated by vegetation dynamics in the various geographical regions in Sierra Leone. Less rainfall and a potential increase in evapo-transpiration could affect the distribution of plant and animal species, which already is under considerable pressure from deforestation for land clearing and energy supplies. Projected climate change is expected to alter frequency, intensity, and the extent of vegetation fires. Potential increases in the frequency and severity of drought are likely to exacerbate desertification. This of course will have a compounding affect on the water availability and further increase vulnerability of the water sector.

The water sector is also already limited in terms of capacity and investment opportunity (especially in the forms of tariffs). The institutional and individual capacity for climate change adaptation is extremely low, leaving this sector particularly vulnerable. Because virtually all other sectors depend on an effective supply of water, the high vulnerability of the water sector has a "domino" effect on the increasing vulnerability of other sectors, e.g. agriculture, mining, health. It also has major implications on other important aspects, like food security. As a whole it can seriously undermine the Millennium Development Goals, the improvement of livelihoods.

Key climate water related issues in project target areas

This project aims to support infrastructure and capacity building in the urban setting (Freetown and Guma Valley Reservoir) and in the rural setting (Southern, Northern and Eastern regions). During the PPG phase explicit community level consultations were conducted to establish local climate related risks, vulnerabilities and capacities, with a focus on the water sector (c.f. UNDP Prodoc pp 22-31).

Freetown and the Guma Valley Reservoir

Freetown is the capital and largest city in Sierra Leone, with a population at roughly 1.2 million. Like the rest of Sierra Leone, Freetown has a tropical climate with a rainy season from May through to October; the balance of the year represents the dry season. The beginning and end of the rainy season is marked by strong

thunderstorms. Under the Köppen climate classification, Freetown has a tropical monsoon climate primarily due to the heavy amount of precipitation it receives during the rainy season.
Freetown experiences abundant rainfall with heavy precipitation events and rising sea levels along the coastal plains. However, the city also faces serious challenges in terms of access to water. Water supply to Freetown and its environs is by the Guma Valley Water Company, which was established in 1961 to serve the then population of 800,000 people. Due to Urban migration as a consequence of the civil conflict, water demand in the city of Freetown now far exceeds the supply. This is responsible for water shortage affecting many parts of the city. In addition, frequent power shortages have exacerbated the situation, as water cannot be lifted to the high well areas where power is needed to pump the water.

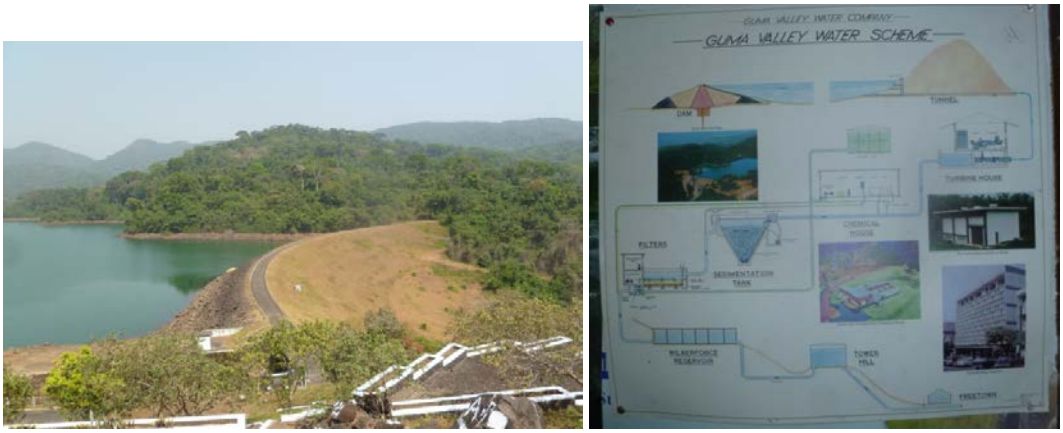

Figure 1 *Guma Reservoir - the major water supply for Freetown comes from the more than 50 years old reservoir that taps springs and rivers from six catchments already under current climate conditions the reservoir cannot supply sufficient water to the city*

This situation is exacerbated by climate impacts. In 2006 an extended dry season caused severe water shortages in the city. An ineffective monitoring system hinders appropriate planning for climate resilience.

Water harvesting practices, especially rainwater harvesting, is prevalent in and around Freetown, especially in the rainy season. Since the water supply from the Guma Reservoir already cannot provide sufficient fresh water for demands in the city, several alternative and supplementary water sources are being explored and partially developed. Community water harvesting is taking place in three communities, namely Mamba Ridge, Thunder Hill, and Cemetery Blue. The water harvesting sources are streams or rivers that are captured for use by the immediate community. The Guma Valley Water Company, through funding from the Indian Government, has also improved the other two community sources at Thunder Hill and e Cemetery Blue. Most inhabitants use rainwater harvesting to provide water for domestic purposes, such as flushing toilets, cleaning, etc. household water harvesting is mainly captured by the roof of a building and sometimes diverted to a gutter from where it is channelled into a storage facility. However, these are often not taken up too positively because the community perception is that rainwater harvesting occurs during rainy season when there is already sufficient supply of water; this could be improved though in areas where households are not connected to the pipeline. Water storage capacities but also quality is a key concern. The usage of plastic reservoirs implies that water collected is not suitable for drinking, as the plastics are inferior quality and contaminate the water.

Rural areas

Southern Province (Pujehun District: Bandajuma Sowa & Gbondapi)

Pujehun District is a district in the Southern Province of Sierra Leone, with an estimated population of 238,919. Its capital is the town of Pujehun. Diamond mining is a major economic activity in the district. The district is also rich in timber in its Gola Forest. The Atlantic Ocean, Moa and Wanje Rivers provide ample fisheries resources. The district has extensive rubber plantations, and large areas of Riverine grasslands have been deemed suitable for rice farming by the Development Plan for the district.
Bandajuma Sowa is one of the rural towns in Pujehun district. Water and sanitation in Bandajuma Sowa remains one of the biggest challenges as it serves as a common business point for the business activities in the area. Several pumps were constructed int he town but a number of them are no longer functioning. As a result, rehabilitation of the well is one of the prioritised needs to address the water issue. Gbondapi is another market town located in the Kpanga Cheifdom of the district. This community faces similar challenges as Bandajuma Sowa. It is placed in a strategic location and is an important trading centre for those people living in the riverine areas. The economic activity of people are fishing, trading and farming.
Both communities/towns face similar climate change challenges – increases in severe events, such as heavy rains and flooding, but on the other hand, also face droughts and sporadic drying up of wells, etc. Issues identified by the communities themselves include wells drying out, river pollution increase due to pollution from upstream being increased in the watershed by heavy rains, polluted hand dug wells and the lack of sufficient facilities.

Both communities have existing coping mechanisms which include roof top rainwater harvesting during the rainy season, but also drinking directly from hand dug wells which would enhance the risk of water born diseases. Currently, there is no provision of water service development infrastructure in Pujehun. There is also no investment plan. Despite the District Council Development Plans, the district depends heavily on the Ministry of Water Resources to help develop the water supply – implying that the ministry has yet to completely decentralise its operations. There is currently only one technical staff, the District Supervisor, who helps to supervise all environmental and water service provisions. There are serious limiting factors to facilitate the mobility of the monitoring and evaluation of the provision of water services. There is also not training of water pump attendants. Very limited informations is available on climate change risks from their own records.

Northern Province (Kambia District: Mambolo Chefdom, Malambay
Kambia is a district in the Northern Province of Sierra Leone, considered as the main rice district of Sierra Leone. It has a large agricultural zone with extensive swamp areas found in every chiefdom, but more in the south-west, dominated by mangroves and large river estuaries. In addition to farming, fishing along the many river estuaries and streams is practised by a large proportion of the population of the district. The Kambia district's main water issues, according to its development plan (2011-2013), is the inadequate supply of potable drinking water, unhygienic sources of drinking water, poor refuse disposal and no pipe-borne water, as well as poor management and maintenance of existing water infrastructure. Rainwater has not been harnessed in catchments, drills or other appreciable technologies in a systematic way to give people regular access to portable water through rainfall. Wells and streams, the main sources of water to the communities, dry up during the dry season and flooding occurs during the rainy season, two distinct issues set to be exacerbated by climate change. The Northern Province is generally drier than other provinces, and the Kambia district is vulnerable to drought implications exacerbated by climate change. However, the district

also faces flooding and sea level rise issues. Kambia's wetlands are deemed as highly vulnerable to climate change, and are predicted to have significant losses in their mangrove forests due to shoreline retreats.

The Mambolo chiefdom is one of the largest chiefdoms in Kambia district. It has an estimated population of 55,545 inhabitants, of which 93% are engaged in subsistence farming. Rice and palm oil production is the main source of produce in terms of agriculture. Mambolo town, which is the chiefdom headquarter has only three (3) hand – pumps with several unprotected water wells. Most of these water wells are found in swamp lands close to their garbage disposal sites. Notably, the towns are very prone to flooding due to the low sea level, and getting the water wells contaminated by heavy down pour of rain. The situation is further compounded by the absence of many latrines/toilets in these communities; especially for the riverine area and some parts of the inland where open defecation is common even before the disaster. The problem of a crisis is inevitable as this pose a serious health hazard in the township and villages.
The town of Malambay has four unfinished, unmaintained wells. Communities here use the local wells and swamp water. The wells dry out during the dry season, and the community struggles excessively to access clean water – with outbreaks of cholera prevalent. In addition, the surrounding communities depend on Malambay for their water sources too. The major interventions needed at community level include a pipe-borne water supply, technical expertise needed to set up management boards to address existing capacity gaps, training of pump caretakers/pump mechanics, health units should be provided with a decent supply of water, as well as renewable energy mechanisms (for e.g. wells, boreholes, water quality laboratory).

Eastern Province (Kono District: Koeyor Chiefdom & Jaima Sewafe Chiefdom
Kono District is located in the North Eastern part of Sierra Leone. A large part of the district population depend on biodiversity products for consumption, fuel (fuel wood and charcoal), construction materials, thatching and roofing materials, ropes, crafts, medicinal plants, fodder, recreational materials (raffia, ornaments), spices, perfumes, poisons, composts, herbicides and insecticides. Mining activities have led to the degradation of the environment, causing air and water pollution as well as food contamination, accidents and vibrations leading to cracking of buildings. Sand and clay mining are carried out along streams sides and swamps, which has led to the degradation of soil fertility.
Climate change risks in the water sector relevant to Kono are the risks of flood and sporadic events of drought, and the increasing frequency of disasters. Most communities don't have electricity supply, or pipe borne water supply. Only a few dotted water wells (boreholes) are found in the communities for drinking and other domestic purposes. Community members scramble daily for the limited water supply provided by the few boreholes available. These boreholes are not chemically treated; hence the frequent out-break of typhoid fever and other water-borne diseases. As a result of the erratic rainfall patterns, these boreholes often go dry due to the reduction of the water table. Family members are forced to travel long distances in search of water from streams and rivers in the forest.
Especially in Jaima Seware Chiefdom, climate change will exacerbate the current situation of wells drying up in the dry season, causing severe water shortages, and flooding during the rainy season. Other issues identified by the community include water quality degradation as a result of mining activities. Major needs coming from the Koeyor chiefdom included improved and resilient water supply both for consumption and business use. The daily scramble for the limited water supply sometimes leads to conflicts among community members. This is a serious socio-economic problem that could bring disunity to the community, and hence affects community development strides that require community cooperation.
Existing coping mechanisms include rainwater harvesting mechanisms, but on a small scale. Efforts have been made to ensure that risk reduction approaches are developed with the view of reducing the vulnerability of the people. It has been noted that ignorance and lack of education have increased vulnerabilities. However,

local communities have for generations developed coping strategies within their environment – this knowledge needs to be tapped and identified for effective articulation of adaptation options.

Baseline Projects/initiatives

Baseline for component 1: Integrating climate change considerations into water policies

As part of the project development, a review of the water related policies on water resources management and related to climate change was undertaken (cf. PPG Report 2). The objective of the review was to assess whether water related policies are sufficient to deal with impacts of climate change, and suggest how to best align climate change issues into policies. A detailed baseline, following the strategic programming principles outlined in therefore section, has been established.

GEF project builds on a set of baseline initiatives that aim to improve the governance and monitoring of water and sustainable development of the country. These development baseline initiatives are focused on (i) current efforts developed by the Ministry of Water Resources to establish relevant policies and planning tools on the water sector at national and subnational levels, and improve the monitoring system of the Guma Valley, (ii) the European Union initiative to support the Environmental Protection Agency for the development of coherent environmental policies, regulations and standards on environment and climate change; and on the Private sector initiative to establish the Sierra Leone Business Forum (SBLF) where the government and private sector are engaged in constructive dialogue.

- **Government of Sierra Leone (GoSL)- water policy**: The GoSL launched in January 2011 the National Water and Sanitation Policy (NWSP) and the implementation of its provisions are currently underway. The policy document focuses mainly on the urgent need for integrated and cross-sectoral approaches to water management and development as well as the provision of safe and adequate drinking water facilities. The policy document covers thematic areas of the water sector such as Water Resources Management, Urban Water Supply and Sewerage, Rural Water Supply, Hygiene and Sanitation, Legal, Regulatory and Institutional Framework. The GoSL is also finalizing the Rural Water Supply Strategy that describes an approach for extending and sustaining rural water supply service delivery across Sierra Leone. The guide is intended primarily to support stakeholders working directly and indirectly in the water supply and sanitation sector. The assessment and analysis of water resources availability and the impact of climate change and catchments degradation on water resources are routinely carried out satisfactorily. However, water policies documents do not mention climate change directly but highlight that some communities will be more susceptible to risks of seasonal flooding and disease outbreaks, as well as other shocks. Key decision-makers (e.g. Water Policy Planning Coordinating Unit (WPPCU),) who are supposed to lead the development /implementation of water policies have limited knowledge of climate change impacts or adaptation responses. Information, including inventory and mapping, is inadequate and staffs from MWR have limited expertise to internalize climate changes into existing water policies.
- **Water Sector Planning Tool-Water point mapping:** The Ministry of Water Resources established a nation wide Waterpoint Mapping, completed on April 2012, to support planning process and investment decision-making on the water supply and sanitation for planning. It provides a true picture of the number of facilities available to the people as well as their functionality. It has identified 28,000 water points, of which 63% (18,086) are functional, 32% (9,290) are impaired and 5% (1,479) are under construction. On the average 40% are seasonal water points (are functional during rainy season only). The planned AfDB support to the MWR foresees the development of a ground water map for Sierra Leone, based on an

extensive survey design. However, none of water point technologies were assessed according to their climate change resilience, taking account of both vulnerability to climate changes (determined by engineering and environment) and adaptive capacity (ability to be adjusted or managed so as to cope in response to different climate conditions). No specific climate risk assessment of future ground water availability is currently planned as part of AfDB intervention.

- **Subnational policies targeting the water sector:** Water and sanitation are the top priority for most of District's Local Development Plan in target areas (Kambia, Pujehun and Kono).
    - Kono district Development Plan 2011-2012 is guiding the development of District in providing basic services to communities. The Plan highlighted the need to address concerns about mining and its associated activities that are impacting on the environment, polluting water courses, water wells, degrading the environment, etc.;
    - Pujehun District Council Development Plan 2012 – 2014 noted the district's potential in mining and consequences in the water sector such as pollution of the environment due to lack of inadequate environmental practices associated with lack of proper water and sanitation services.
    - Kambia District Council Development Plan 2011 – 2013 addresses critical challenges and backlogs of addressing poverty and all its complications within District. The priority identified is to ensure clean and water supply and keeping safe environment.

  However, climate change is not specifically mentioned and so addressed Local decision-makers have limited knowledge of climate change impacts or adaptation responses. Information, including inventory and mapping, is inadequate and staffs from local councils have limited expertise to internalize climate changes into existing local development plan. External shocks will directly affect the ability of communities to pay water tariffs. These communities need to be identified and visually mapped so that robust contingency plans can be established. Meetings need to be held with these communities periodically to ensure communities know what to do in the event of external shocks and all the multiple sources of support are clearly defined.

- **Guma Valley reservoir Monitoring system**: Water supply to Freetown and its environs is done by the Guma Valley reservoir, which supplies 90% of Freetown's water by gravity feed around the peninsular from the west (where it is situated) to the east of the city. Freetown is wholly dependent on the Guma Dam and with no appreciable alternative sources should the dam fail. Guma Valley Company (GVWC), managed under MWR as a parastatal, lacks significant technical information i.e. on climate risks on their main water supply reservoir for Freetown. Guma climate station presently has an Automatic Daily Chart for rainfall recording. It also has an evaporation measuring means through three pans. The equipment is all not only very old but there is no back-up for them. In case of a breakdown of the equipment or in the worst case vandalized or stole, gaps would immediately happen the recordings. UNDP EWS project plan to improve monitoring system for Guma Reservoir. However, interpretation of such EWS information is currently not integrated into risk management contingency plans nor is the overall risk that climate change may pose on the sustainability of water supply to the capital known and debated by policy makers.
- **The European Commission (EU) *'Environmental Governance and Mainstreaming Project'* (4,000,000 euros- 4 years):** In March 2012, the Environmental Protection Agency Sierra Leone (EPA) received grant from the Tenth European Development Fund to ensure the effective implementation of the project. EPA is leading the development of coherent environmental policies, regulations and standards on environment and climate change. Under this project, EPA already established coordination mechanisms

between key Ministries and technical support is in place to define modalities for the mainstreaming of the environment and Multilateral Environmental Agreements (MEAs) into key policy development. However, EPA has limited capacity and tools to guide key ministers through the steps of mainstreaming climate adaptation.

- **The Sierra Leone Business Forum (SBLF)** provides a platform for the government and private sector together to engage in constructive dialogue aimed at identifying, prioritizing and resolving key constraints of private sector development. The Forum has various working groups, including e.g. trade and industry, tax reform. There are major private sector water users including water provision related industries such as fresh water bottling, but also water intense industries such as mining and agriculture/food production through irrigation. Climate change will have a range of impacts on businesses, e.g. *Physical risks* – Extreme weather events increase physical risks to business operations; Resource extraction could be limited by water availability; *Supply chain and raw material risks* – Water scarcity affects production. Given the risks and vulnerabilities across all industry sectors and the significance of expected climate change impacts on businesses, dialogues need to be engaged in the water sector to provide a better understanding of the interplay between public and private sector adaptation strategies/investment, and of possible synergies or conflicts between them.

Baseline projects for Component 2: Strengthening the resilience of water supply systems to anticipated climate change risks,

Sierra Leone is not a water deficient country. However, it is estimated that about two thirds of the rural population does not have access to safe drinking water. A high proportion of basic infrastructure was destroyed during the civil war and maintenance was largely abandoned. The water supply in Sierra Leone (Freetown and the inland settlements) requires very urgent attention. The baseline scenario consists of scattered investments and interventions coordinated by the Ministry of Water in supporting the achievement of the MDG's on the WSS. These investments include:

- **GoSL "Emergency Water Improvement Project"**: The Government has taken several steps over the last few years to support the delivery of water supply. Over the period 2002–2009, the total expenditure of the GoSL for the water and sanitation sector (WSS) was US$50 million over eight years, or US$6 million per year[6].

  In Freetown, the Ministry of Finance and Economic Development provided a loan of about 600,000 USD to the Guma Valley Water Company to provide safe drinking water to vulnerable communities in the Western Area[7]. With this financing, Guma Valley Water Company (GVWC) connected about 38 per cent of properties in Freetown to Guma network and over 500 stand posts are established. The company also replaced the aged pipes to reduce levels of leakage by about 2280 cubic meters per day. Rehabilitation and construction of other water sources are undertaken at White Water at FBC, Cemetery Blue Water at Wellington, Hill Station and Allen Town. Some investments are also made for the construction of gravity scheme at Mamba Ridge and installation of 400 public tap stands in deprived communities within Freetown. With funding from the Indian Government, GVWC also improved the other two community sources at Thunder Hill and Blue Cemetery. However, the review concluded that water harvesting in and around Freetown is highly underutilized as most water flows as runoff into the sea. Best practice water harvesting techniques could provide solutions to many current water storage and distribution challenges during the rainy seasons (such as contaminated shallow wells).

[6] World Bank: Sierra Leone Public Expenditure Review for Water and Sanitation 2002 To 2009, retrieved on 7 November 2012
[7] http://www.mofed.gov.sl/index.php?option=com_content&task=view&id=80&Itemid=1).

In the rural area, Provincial Water Company (formerly called SALWACO) are investing in the water sector. Planned investment identified in the Agenda of Changes (PRSP III) are: the construction of 400 boreholes and sanitation facilities undertaken in large settlement areas in Bo, Makeni, Moyamba, Kailahun, Pujehun, Port Loko, Kambia, Magburaka, Kabala and Kenema and the extension and rehabilitation of gravity system.

- **Action Contre la Faim "Community water harvesting exists in Mamba Ridge, Thunder Hill and Blue Cemetery Communities".** The initiative financed the water harvesting of stream/river sources captured for the use by immediate community in so-called "community reservoirs". These sources were considered as minor sources by the GVWC, and the sources did not feed into the Guma Reservoir because of problems associated with water quality. These minor community sources have had improvements from NGOs and GVWC and have been inter-connected with the Guma Reservoir at some points. The Mamba Ridge source harvesting started purely as a community initiative and has in recent years had intervention through the WASH consortium (Figure XX).

Figure 2: *Images of the rehabilitated Mamba Ridge community reservoir, tapping the source of a local spring for water supply in an area of Freetown that does not benefit from supply from the existing Guma reservoir. The WASH consortium through Action contre la faim (ACF) has been implementing a community engagement project at this site in support of Guma Valley's water supply efforts. The further development of alternative sources of potable water is seen to be an effective climate change resilience building activity.*

- **Community initiatives on rainwater harvesting in Freetown:** Some households in Freetown are applying rooftop rainwater harvesting techniques to complement water supply at a household level. Such techniques are seen to have potential for replication, however, currently are restricted to few users and still required quite substantive initial investment costs for water storage tanks. Such water could be used (treated) for drinking, but also for other household uses such as washing, cooking, cleaning and bathing. Some cultural resistance to an up-scaling of household level rainwater harvesting is reported frequently by water sector professionals. Further information is needed to understand such barriers and to investigate if they can be removed successfully in the future. The current roofing of houses in communities of Freetown also have not been constructed with the forethought to collect clean water (due to the angle to roofing and materials used). New innovations for roofing toward rainwater harvesting are imperative to create a collecting mechanism for clean water. In addition, the current springs utilised around Freetown are badly maintained, over utilised and often even vandalised resulting in poor quality and sufficiency in water. Some actions are undertaken by Engineers without Borders to develop a series of spring boxes improvement alternatives along with recommendations of system maintenance and sustainability for Baoma, with no specific climate resilience considerations.
- **DFID "Water Supply, Sanitation and Hygiene Promotion in Schools, Clinics and Communities in rural Sierra Leone" project:** This intervention will provide 364,000 people in six

target Districts in Sierra Leone (Moyamba, Kenema, Bombali, Tonkolili, Port Loko, and **Pujehun**) with improved access to sanitation, 693,000 people with access to community-owned WASH facilities; 450 Public Health Units (PHUs) with access to community-owned WASH facilities; and 633,000 school children and teachers in 2,000 schools in the six target districts with access to school-owned WASH facilities. UNICEF and Plan International will undertake work through the oversight of the Ministry of Water Resources. The total budget of the project is £21.5 million over the period February 2012 to February 2015. The project is at the start-up phase.

- **Other partner's intervention:** The **World Bank** is supporting Emergency rehabilitation and improving water and sanitation services to these towns and enhancing the institutional and financial capacity of PROWACO. **UNDP** is providing reliable and safe drinking water for the three most important military barracks in Freetown. UNDP is improving the delivery of social services through the construction and rehabilitation of community and government infrastructure such as water and sanitation systems and the connection of the water distribution lines to the dam and water tank (reservoirs etc.) within rural communities. The **AFDB** is also in the process of finalizing its support investment in terms of establishing water infrastructure to the three selected districts of this project, namely Puhejun, Kono and Kambia. AfDB is a partner in this project and has recently submitted a standalone PIF to the GEF, building on the experiences from this project - a strong up-scaling strategy. Finally, there is some on-going research into the development of innovative technologies already, with low-cost and safe household level water pumping, purification and storage being pioneered through the **Welthungerhilfe, German NGO**, in Sierra Leone. Two community-training centers for the replication of the designed and tested technologies exist in Grafting (near Freetown) and Kenema. Currently, their work is focused on sustainable water supply mainly, with no specific climate resilience considerations. Finally, **Engineers without Borders** is to developing a series of water source improvement alternatives, specifically the system maintenance and sustainability of spring box in Baoma, Freetown

From the PPG phase consultations it emerged that one key problem is the availability of drinking water during the dry season and prolonged dry spells. All communities listed this as their major climate change related vulnerability. The Guma Valley Water Company cannot supply Freetown's population with water from the dam alone and currently there are no alternative or supplementary options. A few communities rely on springs and some households have rainwater-harvesting mechanisms but these are limited and often not used for drinking water.

In rural areas, limited infrastructure exists to harness the water from the wet season to be stored for use in the dry season. Communities currently rely strongly on the few open surface wells which are often riddled with water borne diseases, or have to rely on springs, which periodically dry up. Additionally, problems persist with maintenance of existing hand pumps of wells and lack of capacities or overutilization resulting in decreasing community access to clean water. Current infrastructure and harnessing rainwater innovations are rare and very little exists in terms of climate resilience and adaptation of new technologies to local context.

Both in Freetown but also in the regions, weak and lacking infrastructure is by far the largest barrier to access to safe water in the face of a changing climate, and urgent adaptive and climate smart infrastructure rehabilitation is an urgent need. The current water supply systems have shown their limitations and are expected to be incompatible with changing climate conditions and increased variability. The projected rainfall from 1961–1990 to 2100 under the General Circulation Models (GCM) output show a decrease in rainfall by

about 3% and 10% below current monthly and annual rainfall values respectively. Analysis carried out on local rainfall data and inter-annual variability projections linked more firmly to drier conditions in the near future. This scarcity of surface water during the dry season will limit the use of low lift pumps. Presently, wells are dug deeper during the past season because of the low level of the water table. The NAPA reported that low rainfall in June 2006 resulted in water level at Guma Reservoir, reaching a critical point resulting in widespread rationing. In addition, the public financing shortfalls lead to insufficient coverage of climate-resilient water supply systems. This shortfall highlights the long-term threat to the security of the capital's and rural community's water supply.

No infrastructure exists to harness the water from the wet season to be stored for use in the dry season. Communities currently rely strongly on the few open surface wells which are often riddled with water borne diseases, or have to rely on springs, which periodically dry up. Additionally, problems persist with maintenance of existing hand pumps of wells and lack of capacities or overutilization resulting in decreasing community access to clean water. Current infrastructure and harnessing rainwater innovations are rare and very little exists in terms of climate resilience and adaptation of new technologies to local context.

Long-term solutions and key barriers

The ultimate long-term solution would be to have an enhanced capacity of decision-makers in the public and private sector involved in water provision to plan for and respond effectively to climate change risks on water resources. They would ensure that water sector investments made are climate resilient, with mainstreamed adaptation in water development frameworks at country level and targeted vulnerable areas. Adaptive mechanisms and innovations are being tested in target pilot sites, at the local community level, and lessons learned synthesised for systematic up-scaling. It is recognised that climate change is not the only threat to the water sector in Sierra Leone, however, the below analysis does specifically address this threat.

Key barriers

Difficulty to react to uncertainty of climate risk: Climate change is a hard issue to address and manage: (1) effects may take a long time to be felt (2) it is still not clear what they will be, and (3) therefore the best way to manage them cannot be predicted with any precision. Above all there is a complex interrelationship with the impacts of environmental destruction because of human action that leaves many societies vulnerable to the slightest change in weather regimes that are so important for their access to clean and safe water. The increase in variability and unpredictability of global climate will have impacts across the world. In West Africa, rainfall patterns will be disrupted and temperatures will increase, but the detail of these effects cannot be accurately predicted and the effects of climate change at country level are similarly poorly understood. Sierra Leone needs to formulate and start to implement responses to the likely future global changes in climate.

Absence of reliable/up to date information on climate impacts on key sectors, including gender specificities: The decade old civil war limited institutional capacity to systematically collect and analyse data to inform climate resilient policy formulation. Inadequate staff and poor facilities for weather forecasting and related activities have undermined the ability of the Meteorological Department to provide adequate support information to other sectors of the economy so that they can better adapt to the impacts of climate change. Whilst some targeted efforts are underway by institutions such as the UK Met Services through funding by UNDP and others, to systematically strengthen the Meteorological Department's capacity, there are major gaps in technical skills for generation information on climate change (for example: downscaled or long-term forecasts are non-existent and/or not utilized). There is limited dissemination of available forecasts, and forecasts are not packaged in a format that is accessible to end-users such as sector specific technocrats, district planners or policy makers.

No specific climate risk analysis for any sector has been undertaken in Sierra Leone so far. Although the First and Second National Communications to the UNFCCC do include initial assessment including on the water sector, it is clear that this has just the beginning of a process and further efforts have to be made to improve the information base. One key consideration in the water sector must be that gender sensitive analysis and planning must be undertaken to ensure that water supply and management will be effectively more climate resilient in the future.

Currently there is limited access to reliable information for effective climate risk management. The lack of a climate information communication system enhances the country's vulnerability. Without appropriate information and climate risk management tools, policies will lack the right navigation to govern climate risks in the water sector. In turn, no appropriate monitoring systems are in place to monitor the largest water reserve (Guma) on which Freetown depends, neither are climate risk assessments and contingency plans operational.

Weak national and local knowledge base on climate impacts, risks and opportunities and insufficient sharing and learning mechanisms on climate change: As a result of the war, desegregation of communities due to migration has severely weakened the local knowledge-base with limited transfer of indigenous skills between and within communities. The use of available global and other external knowledge bases is also limited for a number of reasons that span from awareness that various tools exist and are available to knowing what to do with the information once it is secured. This knowledge gap is evident for innovations and actions in the water supply sector per se, and is even more pronounced in terms of public awareness of (a) climate change impacts, (b) possible adaptation measures, and (c) how human interaction can either diminish (through adaptation and preparedness) or exacerbate climate change impacts. During local level consultations some existing coping strategies were identified, but overall communities seem still overburdened to deal with the detrimental effects that the long war had on their daily livelihoods.

It is evident in Sierra Leone that very limited consideration of gender specific vulnerabilities, needs and possible solutions are included in decision-making. So far gender specific climate risk and opportunities have not been addressed systematically generally and specifically in the water sector.

Climate risk information, adaptation options and knowledge are not shared and disseminated as widely as needed to enable communities to cope with the adverse climate impacts. There is no learning system in place to capture, codify and inform scaling up methods. In addition, there is no regular flow of information and dialogue on climate change between parliamentarians, local council members, traditional authorities, NGOs/CBOs, and the private sector.

Current policies, strategies and regulatory mechanism have limited or no consideration of climate change issues: Key institutions such as the Water Policy Planning and Coordination Unit (WPPCU) and the Sierra Leone Environmental Protection Agency (EPA) are severely constrained by human resources with the appropriate scientific and technical capacities necessary to internalize climate change issues into policies, strategies and regulatory mechanisms. Although Sierra Leone recently successfully established its National Climate Change Secretariat (NCCS), it is clear that without dynamic and sustainable systems, including local competencies to generate and use relevant information on climate change risks (and associated economic impacts), integrated climate resilient policy formulation is severely constrained, if at all possible. The newly established Water Act of 2012 is considered a major achievement and was strongly supported by the targeted donor support to the Water, Sanitation and Hygiene (WASH) cluster. Currently the Act is not yet underpinned with relevant regulations, and it only contains basic climate change risk considerations at present.

Public financing shortfalls lead to overall infrastructure challenges and insufficient coverage of climate resilient water supply: Since the war only just some basic water infrastructure has been rehabilitated or newly established. Investments into the development of new or old water infrastructure are being made by several donors both for urban water supply in Freetown and in the various districts. This specific project is designed to assist some such donor supported investments in building climate resilience in their project work. But it is recognized that the overall infrastructure challenges are still a major concern and barrier to achieving the overall solution. Since 2008, local councils have been required to manage all urban water supply activities (except Freetown) and peri-urban water supply schemes. Unfortunately, these decentralized public bodies are frequently not prepared for the task, lacking finances, capacity and institutional authority to respond effectively to the demands of the population, specifically on climate resilient water supply systems. Scarce public finance needs to be used to catalyse and leverage additional resources for the necessary investments for the operation, maintenance, and management of vulnerable infrastructure. Outreach to the community-level is particularly weak. Although the Water Act makes specific provisions for rural water supply and establishment of WASH committees, no significant roll-out has commenced. The so-called WASH consortium of NGOs has pioneered some innovative and locally applicable approaches to rural capacity support, but especially recurring financial and human resource bottlenecks at district level hamper a more speedy service provision to the rural areas.

Limited technical capacities and limited innovations, especially to react to impeding climate **risks:** Similarly, it is recognized that in Sierra Leone the technical capacities are very limited, mostly as an entire generation of (young) professionals is missing due to the war. One key barrier is the lack of technocrats and practitioners in the water sector including water engineers and others, another is that those professionals who are employed often lack the opportunity for professional updating on emerging issues such as climate risks and adaptation options and solutions in the water sector. There is a serious underrepresentation of female professionals in all water related jobs, and special gender support policies must be implemented as a matter of urgency to address this development short coming. At this point there are limited innovation technologies that are being developed locally. Whilst some international organisations and NGOs have invested into the development of low cost community water supply (e.g. Welthungerhilfe), mechanisms for community water management (e.g. WASH Consortium), rehabilitation of water infrastructure (e.g. Jica, DFID), most of these are focused on immediate water provision. Innovations in terms of determining long-term sustainable water supplies, including a consideration of climate risks, development of larger scale rain water harvesting techniques etc. are still only peripheral. Gender sensitive and tailored technology innovations are needed to reduce specific vulnerabilities of women. Where such innovations are being pioneered they often do not find their way into a larger public domain or are readily picked up by public services for further dissemination at this point. This can, to a large extent, be attributed to the various capacities bottlenecks in the country.

A5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

Incremental cost reasoning

Business-as-usual climatic models, mostly drive donor investments including in the water sector currently, and few such investments are mindful of newly emerging climate risks and opportunities. It is clear that investments by other cooperation partners e.g. DFID, WB, UNDP, NGO, etc. at this point focus on delivery of infrastructure and with limited cognisance of climate related issues impacting on such developments. At

this point reliable and local level information on the climatic risks, vulnerabilities, but also on already existing coping strategies and adaptation action is absent in Sierra Leone and/or not well documented at all, including for the water sector. Limited or no research is supported that would further strengthen the development of locally effective and acceptable techniques and technologies that would help build climate resilience water supply at household, community and even settlement and urban levels.

The Government of Sierra Leone requests the LDCF to finance the additional costs of enhancing the resilience of water sector to climate risks, within the context of policy planning/budgeting and investments in the vulnerable districts. In this context, the project objective is to "*enhance the adaptive capacity of decision-makers in the public and private sector involved in water provision to plan for and respond to climate change risks on water resources*".

In order to overcome the identified barriers, the proposed initiative will improve knowledge and information by enhancing capacity and understanding of climate risk management in the technical staff pool as well as within the decision-makers base will improve planning for resilience and climate risk management.

The project will support capacity and human resources development to support policy processes and climate resilient decision-making. The capacity of key staff will be enhanced coupled with an integrated and sustainable climate information and communication system that will greatly enhance the information necessary for planning, including information necessary for climate smart investments and development. With capacity building programmes at institutional and local level, a sample of working force will have a much better understanding of the risks and impacts of climate change, as well as the potential of supporting existing coping mechanisms and pioneering adaptation solutions. Targeted capacity building approaches through both components of this project will focus on climate risk analysis and management, especially within the pool of engineers, community water supply practitioners, government officials, and the like. Gender inclusions as part of modules in capacity building approaches will support the integration of gender equality in the sustainability aspects of the project. Gender focuses and considerations in capacity building approaches with regard contextual gender differentiation of roles and responsibilities at community level will go a long way in efficient project implementation. The capacity building initiatives of both technical staff and decision-makers will enhance understanding of climate resilience and risk management for effective integration of climate risk into planning and policy development. The envisaged bottom-up approach in which dialogues are formed between all decision-makers will also create a platform in which planning can be conducted based on vulnerabilities within the water sector to climate change. Effective monitoring, as well as a central climate communication and information system, will also aid planning and policy development in an integrated and climate smart manner.

Effective climate risk assessment and contingency planning for Guma Reservoir will be established, based on improved monitoring systems. This will secure pre-planning for water access and also help towards building an Early Warning System. Also, the Water Point and Groundwater mapping tools will be updtaed to adapt them to new aspects of climate changes developments by taking account of both vulnerability to climate changes (determined by engineering and environment) and adaptive capacity (ability to be adjusted or managed so as to cope in response to different climate conditions).

In term of demonstrations and innovations, the proposed project will put in place climate smart infrastructure, which is resilient as a pro-active approach to enhance overall access to water within a climate insecure future. With support to various existing developments for climate smart infrastructure, specific to site, such as innovative and futuristic rainwater harvesting mechanisms to gain access to water in the dry season, could greatly enhance the water infrastructure in Sierra Leone. Gender sensitive and tailored technology innovations will be implemented to reduce vulnerability of women.

Private Public Partnership building will support cooperative responsibilities in climate smart water supply infrastructure investments, create a platform for innovative entrepreneurships for effective water supply and harvesting mechanisms.

Finally, lessons learning mechanism and up-scaling will be established through a sharing of information on existing coping mechanisms, adaptation alternative, what works, and what doesn't to shape up country knowledge, at community level, the opportunities that exist within the adaptation arena to create and maintain resilient water supply infrastructure.

Project Outputs /Activities

COMPONENT 1: Integrating climate change considerations into water policies

An important prerequisite for informed decision-making on adaptation is that it should be based upon the best available information on the implications of both the current and the future climate in the country. Improved information and tools on climate change risks and vulnerabilities is generated in Sierra Leone to enable evidence-based and informed policy decisions. This is will mainly support three strategic areas, (1) increased human resource capacities to lead the implementation of water policy, taking account of both vulnerability to climate changes (determined by engineering and environment) and adaptive capacity (ability to be adjusted or managed so as to cope in response to different climate conditions); (2) improved management of Guma reservoir to mitigate the overall risk that climate change may pose on the sustainability of water supply to the capital; and increased understading of climate risks by key water supply stakholders (parlementarians, traditional authorities, local communitites, Donors and Private sector, etc.) to cognise the climate related issues impacting on the water sypply and identify adaptation coping mechanisms based on lessons learned and best practicies demonstrated by the the project.

The EU Project on environmental governance is used as a vehicle to mainstream climate change considerations into the WASH policy as a prerequisite for enabling more climate smart investment. As part of advancing this key result, LDCF resources are dedicated in part to finance the provision of relevant climate information and train government agencies to scale-up efforts to address climate change in water policies. The Meteorological Department plays an important role as data providers, and LDCF resources put in place the software (skills, competencies, mandates, process mechanisms) and hardware (tools) that are necessary to support policy formulation that is informed by relevant climate change information.

Policy roundtables and other relevant information sharing platforms will be put into place to support a national and regional debate on climate change and to generate better understanding of the climate risks as well as adaptation options for the water sector. Technocrats, policy makers, donor organisations, national and international NGOs will be targeted to be part of such knowledge exchanges. Lessons learnt from component 2 of this project will ideally also be integrated into such debates, ensuring that best practices can be replicated and further up-scaled in the future.

Output 1.a: *More than 50 officers from the Ministry of Water Resources, esp. the Water Policy Planning Coordinating Unit (WPPCU), the Sierra Leone Environmental Protection Agency (EPA) and Districts leaders provided with relevant climate risks management guidelines/tools and trained on how the results of the climate risk/vulnerability assessments should be used to adjust regulations and policies governing the water sector at national (NWSP, RWSS) and local level (Districts development plans)*

Technocrats from MWR and EPA in Freetown, but particularly regional technical staffs have extremely limited opportunity for professional updating, and usually find it difficult to address newly emerging technical issues and practices into their ongoing work. One of the major limitations is the lack of capacity to deal with climate risks and understandings of managing these risks in the water sector.

Relevant professional updating and training materials must be designed and developed, based on relevant local information. In developing climate risks tools, training and professional updating materials it is essential to identify the demand for such learning opportunities, and more importantly the content that should be developed. Following cutting edge learning principles and approaches, participatory methods should be applied as a principle from demand articulation to module execution to ensure that the offered trainings have the desired impact on the target groups and effectively lead to changes in decision-making in the long-term. Gender specific information elements ought to be integrated into such materials, as gender sensitive analysis and planning is an important aspect of effective climate risk planning and response.

Facilities at the EFA Environmental and Sustainability Learning Centre in Lakka (Freetown) could be used to support this and other training and learning outputs. Learning material on climate changes and Water from CAPNET will be adapted to meet the training needs at national and local level. Finally, UNDP TACC Facility will be used to support the development of relevant Tools on climate model projections for river basins/watersheds and the updating of water point, groundwater mappings.

Indicative activities for Output 1.a:

i. Undertake a Climate Change Risk Management (CCRM) capacity assessment of MWR-EPA and District staffs and profile their professional updating needs. This include the identification of gender-based capacities and resources for managing climate changes risk; and also the assessment of required tools climate risks management including vulnerability maps, climate scenarios, extreme event forecasts, indicators of vulnerability and monitoring systems.

ii. Based on the assessment, develop climate risks tools and learning programme (i.e. including modules on generating, analysing, and integrating climate risk information). Gender issues will be appropriately highlighted throughout the entire training material. The Center for International Earth Science Information Networks (CIESIN) based at the Sierra Leone Environmental Protection Agency (EPA) and Met Department will support the production of climate risk/vulnerability assessments for decision-making. The training package will be developing with CAPNET.

iii. Conduct at least four trainings at the Lakka Centre or other relevant learning centres. It will be ensured gender balance among participants and the use of participatory learning format allowing both men and women to interact, exchanges of experiences and develop common vision and understanding on climate risks management.

iv. Set up and test an on-the-job learning approach to ensure that learning objectives are directly applied to daily responsibilities. It will be ensured that gender concerns are fully integrated in formulation, implementation, monitoring and evaluation of such approach.

v. Update the Water Point and Groundwater mapping tools to adapt them to new aspects of climate changes developments;

vi. Establish participatory roadmap to guide the adjustment of regulations and policies governing the water sector for the inclusion and the provision of climate smart finance;

vii. Monitor learning impacts and applications with the use of Gender-disaggregated monitoring and evaluation system to measures how trainings affected both women and men.

Output 1.b: *Climate change resilience plan and emergency contingency plan for the Guma Reservoir*

The water supply in Sierra Leone (Freetown and the inland settlements) requires very urgent attention. Guma Valley Water Company is incapable of meeting the water supply requirement of the city, even under unchanged climatic conditions.

The Guma Valley Water Company (GVWC) has relied primarily on use of measuring the water level of the dam rather than stream flow measurements because the flow installations had become unserviceable and as a result, rainfall/runoff relationships have been difficult to determine. The Guma Reservoir has almost always been full during rainy season and this has led to a water resource system that is vulnerable to two different types of water stress, extended dry seasons (more common), and 'true' drought events where the rainy season rainfall is extremely low and may not be sufficient to fill the reservoir.

A regional GEF project also implemented through UNDP is focusing on building EWS in priority sectors in various countries throughout Africa. The Sierra Leone project is foreseen to work jointly with this specific project intervention in the Guma area. A joint site visit was undertaken during the project preparation and complementary but stand-along project activities will focus on strengthening this important water supply to the capital. Whilst the EWS project will focus on establishing and improving the GVWC monitoring system, this project will address vulnerabilities to climate related disasters which may occur. A climate resilience and emergency contingency plan for the Guma reservoir will be developed through this specific output, and relevant upstream policy dialogues on the relevant support actions that will have to be put into place will conducted. This includes the following measures: (i) *Mitigation measures* taken in advance to reduce adverse effects, which were anticipated but not certain at the planning stage; (ii) *Hedging measures* taken in advance to reduce the risk of possible adverse effects that have newly been identified; (iii) *Defensive measures* taken after a risk has materialised, but the damages are such that the plan does not need to be modified; (iv) *Corrective measures* taken after a risk has materialised, but the damages are such that part of the plan has to be modified; and (v) Reassessment if the plan is clearly not working and needs to be reassessed.

<u>Indicative activities for Output 1.b:</u>

i. Undertake a Climate Change Risk Management (CCRM) capacity assessment of Guma reservoir and prepare TOR for the selection of consultant;

ii. Commission a climate change resilience plan and emergency contingency plan for the Guma Reservoir based on large consultation process engaging GVWC, Met Departement and communities surrounding the reservoir;

iii. Train GVWC staff to run the climate resilience and emergency contingency plan;

iv. Establish processes for review, reassessment and evaluation of the climate resilience and emergency contingency plan.

Output 1.c: *Regular dialogues established between parliamentarians, local council members, traditional authorities, NGOs/CBOs, and private sector (WASH committees) on the impacts of climate change on water supply in Puhejun, Kambia and Kono districts*

The lack of communication among different decision-makers has been a limiting factor to climate smart planning and implementation. Although the decentralization policy allows for councils to take charge in their water management, lack of capacity and staff, and access to resources from central government challenge effective management at council level.

Developing regular dialogue between all stakeholders, in a bottom-up approach, would maintain effective decision-making and create a better support structure for decentralized authority to take effective decisions and implement them. Such debates will be supported by evidence based information on climate risks and adaptation options, stemming from other project components and outputs. In particular, the district level pilot projects under component 2 will provide insights from local level climate risk, vulnerability and capacity assessments, as well as reviews of existing coping strategies and piloting of new adaptation inventions.

Good communication practices and principles will be embraced, and policy dialogues should be organised in a manner that an appealing venue with relevant learning demonstrations should at least partially be utilised. The local NGO EFA could be a strategic partner for such activities to be conducted in Freetown, whilst other NGOs and consulting services may be recruited on the district level.

Indicative activities for Output 1.c:

i. Conduct Participatory Rural Appraisals (PRA) for relevant national and district level stakeholders Freetown, Kambia, Kono and Puhejun (parliamentarians, local council members, traditional authorities, NGOs/CBOs, and private sector (WASH committees) to determine existing capacities and training needs on longer-term climatic and environmental changes. The participation of women and young organization groups groups will be ensured to assess their specific needs.

ii. Design and conduct a community awareness campaign on climate change risks using culturally appropriate tools and aimed at all genders, including information packs that comprise examples of community-based adaptation measures in the water sector. The awareness campaigns will be tailored to the specific needs and concerns of women and men. They will be evaluated at least once per year to determine if women are effectively involved in the process. Key lessons learnt from the various project activities (especially the demonstrations under component 2) will be distilled and integrate them into the agenda of the dialogues, as relevant for the target groups;

i. Train at least 10 WASH committes representatives to assess climate change issues, community-based adaptation planning, and household-level risk reduction interventions. Climate risks management and training tools developed under Output 1.a will be adapted to WASH committees needs;

ii. Create a sustainable communications platform in which a dialogue can ensure and further friendly communications can take place to inform a bottom-up decision-making process.

iii. Monitor the effectiveness of awareness programmes and improve quality of local capacity building efforts based on monitoring results

Output 1.d: *At least two dialogues under the Sierra Leone Business Forum and WASH Donors Investment Plateform initiated on managing climate change risks on water provision and usage*

Understanding the private sector's role in adaptation is crucial, as countries' success at adaptation will depend on the success of the private sector and other private actors in responding to climate change impacts and risks. Additionally, private sector responses may provide lessons and examples of innovative approaches of interest to the public sector.

As per the main objective of this project, ensuring climate smart investment (both from private and public sector, including through the donor community) is of great importance. The project aims to develop a private sector buy-in to climate smart water resource infrastructure and development. This will done through the establishment of dialogues between Public and Private Sector that creates a transparent relationship for common goals, and ensures that the lessons learnt i.e. by MWR from this project can be effectively communicate and discussed amongst such partners.

It will also create a platform of international and national water engineers (including architects) to support the designing and pioneering of resilient water systems for poor communities.

Indicative activities for Output 1.d:

i. Undertake strategic stakeholder analysis and target group specific information and communication needs and strategic responses (e.g. communication plans) as they relate to climate change resilience in the water sector. This could include also the identification of target group's engagements in addressing climate change risks and establishing relevant adaptation strategies;
i. Conduct two dialogues on the through (i) selected priorities;
ii. Create and make functional water engineers platform to support designing of resilient water supply systems;
iii. Develop a functional knowledge management system that documents such policy level dialogues to ensure that the outcomes find their way into national development planning and negotiation with investment partners.

Output 1.e: *Relevant experiences/lessons from community oriented climate resilient water infrastructure and management practices (including gender differentiated issues) identified, and widely shared/disseminated to facilitate replication in other vulnerable areas*

No solutions ever come to fruition if efforts toward solutions are not tested for their effectiveness. A vital component of the project is to ascertain lessons learnt from the community oriented climate resilient infrastructure and management practices so that the best practices can be shared into other areas.

Indicative activities for Output 1.e:

i. Establish a **communication and knowledge sharing mechanism,** the project team will (a) undertake a knowledge audit that provides a structure for gathering data, synthesising findings and making recommendations about the best way forward for knowledge and learning initiatives; and (b) frame the Social Network that establish relationships and knowledge flows between individuals and groups.
ii. Design a **data/information sharing system/platform** as technical support that enables communities and decisions makers to access relevant and usable information about how to deal with

climate changes, and begin to use this material to guide their decisions about water management. Clear protocols will be developed for documenting and disseminating project knowledge. To maximize the usefulness of information and sustainability, the data system will be linked to the existing WASH information platform managed by the Statistics Sierra Leone and the Water Supply Division of the MWR in partnership with the 19 local councils. Key indicators related to climate related index or technology will be set up based on consultative process undertaken with relevant actors in the WASH sector.

iii. **Develop a communication strategy** that includes a strong grassroots community-driven component to foster greater ownership and enable replication. Depending on the target groups involved, suitable mode of communication will be developed e.g. local knowledge forum, product exhibition, participatory video and community radio shows on successful community-based adaptation approaches. Keys knowledge sharing tools will applied such as: (a) the dissemination of a catalogue of best practices of community oriented climate resilient water infrastructure and management practices; (ii) the development of storytelling that permitting learning through the presence of a narrative structure; the organisation of exposure visits to bring decision-makers and planners at the national, districts and chiefdom levels and WASH Donors investments platform to demonstrate experience successfully adaptation measures. Key lessons learned, project communication products will also be translated in relevant national languages and packaged in appropriate format for transmission via community radio broadcasts or national television local language channels. A catalogue of best practices of community oriented climate resilient water infrastructure and management practices will be developed for wider dissemination. Knowledge capitalised will be inject into policy level components of outcome 1, as well as through learning and training outputs under outcome 2.

COMPONENT 2: STRENGTHENING THE RESILIENCE OF WATER SUPPLY SYSTEMS TO ANTICIPATED CLIMATE CHANGE RISKS

In the adaptation alternative the principle baseline initiative in water resources management (AfDB, WASH, and others) will have climate resilience integrated, with infrastructure and storage, but also management principles, improved for Freetown and Pujehun, Kambia and Kono districts.

In Freetown, innovations for supplementing current water supply through rain water harvesting and securing small sources as well as one larger source will be pioneered. Affordable climate-resilient community based water harvesting capture, storage and distribution systems will have been designed and built on a demonstration basis. More than 100 households in Freetown will have more secured and climate resilient access to water for household and community uses. The beneficiaries are fully aware of related water and climate risk management matters and are in a position to manage and maintain them effectively.

Appropriate climate resilient adaptation techniques for the water sector are being replicated, improved, tested and implemented in the three pilot districts. Working with at least six communities identified by the District councils and district level WASH supervision officers during the project preparatory phase (Pujehun: Bandajuma Sowa,Gbondapi, Kono: Koeyor community Jaima Sewafe Chiefdom, Kambia: Mambolo Chiefdom, Malambay – see Situation analysis) climate resilient local level water supply and storage systems will be pioneered in these sites. Adapting already existing innovative technologies, a focus will be on water collection during the rainy season and storage for drinking water usage in times of prolonged dry-spells and

drought. Hand-in-hand with the establishment of such technologies will be the establishment and training of WASH committees through the district staff of the MWR. More than 100 households will benefit from this targeted dry season water supply.

Site specific interventions will be guided and informed by local level climate risk analyses, vulnerability assessments and the documentation of existing coping strategies. District level water engineers (from both the public and private sector), NGOS, local community based management committees, youth and women associations and others jointly and in a participatory approach work together as learning partners and engage in meaningful dialogues on climate risks, needs assessments and planning responses, to ensure that functional and long-term solutions to the impeding climate risks in the water sector are being set up, including through community-based water management approaches.

Stakeholders are capacitated to design and manage climate risk on small-scale water supply systems as well as maintaining climate resilient infrastructure.

It was additionally recognised, that climate resilience in the water sector can only be achieved if water provision, management and utilization are being addressed in a more inclusive manner, particularly incorporating the end user with a targeted and sensitive gender focused approach and understanding, through analysis, gender differentiated roles and vulnerabilities. Overall recognition of climate risks and possible adaption responses needs to be generated amongst the water sector technocrats but also amongst the local communities. Therefore a participatory and gender sensitive engagement with the end users and the "deliverers" will be established by this project, in line with the WASH policy and under leadership of MWR.

Output 2.a: *Pilot demonstrations of innovative climate resilient rainwater collection in at lesat 3 public building with reservoirs established to support the bottleneck of drink water supply in the dry season*

Currently 90% of the population of Freetown depend on the Guma Reservoir for their water. This puts immense pressure on the reservoir, and leaves the population very vulnerable to one source. In addition, many of Freetown's inhabitants do not have reliable access to water.

As part of the PPG phase, a review was conducted of the water harvesting mechanisms in and around. This included an in-depth literature review, as well as a rapid assessment by undertaking visits to various communities in and around Freetown. The objective of the review was to develop a framework of water harvesting techniques which are already being applied (existing coping mechanisms), determine pre-feasibility assessments of up-scaling current coping mechanisms, or testing new ones; and finally, investigating existing community reservoir projects of Guma at three sites and document soft and hard investments for possible rehabilitation or construction of new reservoirs or cisterns.

A strategic partnership between EFA and Architects without Borders[8] exists, and relevant expertise to design the prototype RWH technologies and infrastructure have been sourced and will be partnered with during project implementation – many of the innovative designs for the new rainwater harvesting will be drawn through this partnership It is important that the relevant skills are transferred to local professionals, and that materials used can be sourced locally or at low cost etc. to insure feasibility for later up-scaling of the

[8] http://www.architectswithoutborders.com/

innovations. It will also be important to partner with Engineers without Borders[9] - an international association of national engineer groups who's mission it is to facilitate collaboration, exchange of information and assistance amongst member groups and to help build the capacity to assist poorer communities.

LDCF resources will support the demonstration of rooftop rainwater collection in at least 3 public building with reservoirs established to support the bottleneck of drink water supply in the dry season. The outside office of the MWR, which currently is under re-construction and will be the home of the project implementation unit for this project, will be supported through the integration of rain water harvesting demonstrations on site to ensure that the MWR is positioned to clearly demonstrate and promote practicable climate resilient solutions to its of staff, decision makers and the public.

In addition to the office of the MWR, two other buildings (the EFA building and the hospital in Murray Town) will benefit from pilot demonstrations of rooftop rainwater collection with reservoirs in order to also support the bottleneck of drink water supply in the dry season. Proper consideration should be made with regards to materials needed to enhance and maintain the collected water quality. One of the best-known techniques is a ferro-cement[10] roof – rooftop catchment systems gather rainwater caught on the roof of a house using gutters and down pipes which lead into a very large (or more) storage container (ideally a ferro-cement tank). The tanks will have to be large and appropriate for long terms storage of drinking water (and big enough to collect a lot of water). Preliminary figures and information is given in the prodoc.

TABLE 1: Rainwater harvesting values estimated for the efa building in freetown

Rainwater harvested	Calculation	Calculation source	Human consumption per day	Approx No of people provided with water for six month period
2 709 000 litres	Southern side: 3500mm x 436.7 x 0.9 Northern side: 3500 x 423.3 x 0.9	Avg yearly rainfall x roof area x constant (0.9) http://home.iprimus.com.au/foo7/tank2.html	25 litres	602

FIGURE 3: *The environmental and sustainability learning centre of efa at lakka (left), and the mwr piu house (right), both of which will benefit from rwh technologies as demonstrations underpinning trainings and political dialogues, amongst other*

[9] http://www.ewb-international.org/
[10] Ferro-cement roofing offers unmatched speed of construction and is used for schools, residences, community buildings, among many others.

Indicative activities for Output 2.a:

i. Conduct relevant assessments to determine feasibility, cost-effectiveness and due-diligence with respect to environmental and other standards;
ii. Commission design of innovation technologies and infrastructure
iii. Construct the rooftop rainwater collection with reservoirs in MRW, Murray Town Hospital and EFA buildings. The system will consist to three basic elements: (i) a collection area which is the effective roof area; (ii) a conveyance system usually consists of gutters or pipes that deliver rainwater falling on the rooftop to cisterns or other storage vessels; (iii) and a storage tank or cistern.
i. Establish procedures of maintenance including: (i) the procedure for eliminating the "foul flush" after a long dry spell; (ii) the periodical cleaning of the tank; (iii) the cover of the rainfall collection surfaces to reduce the likelihood of frogs, lizards, mosquitoes, and other pests using the cistern as a breeding ground; and (iv) the chlorination of the cisterns or storage tanks.
ii. Evaluate and map potential sites for replication in large communities in Freetown

Output 2.b: *Spring water improvement designed, tested and demonstrated in high density area in Freetown (benefiting at least 200 households)*

The current springs which are utilised around Freetown are badly maintained. The construction of spring boxes will be conducted and put in place to protect the springs from vandalism and overutilization. The main objective of spring protection is to avoid spring contamination and increase the capacity, convenience and safety of the potable water system. Just as there are many types of springs, there are also many different kinds of protective structures, such as spring boxes, seepage spring development structures, and horizontal wells. However, spring boxes are typically cheaper, require the least skill, and can be made with locally available materials. In contrast to the generally held belief that discharges decline if the springs are touched, the development of natural springs often leads to improved yields.

FIGURE 4: Collection of water in spring box

Partnership will be develop with Engineers without Borders which already develop similar exercise in Freetown with an additionality component on the resilience of the system to climate changes. Additional investment are also expected on stand-alone roofs to supplement these springs and for provision of water in the dry season (e.g. a simple version at household level).

Gender sensitive analysis will be an important component with a need to integrate gender considerations throughout these activities – during design, assessment, demonstration, and especially with regards exposure and training programmes toward maintenance and upscaling.

FIGURE 5: *An example of household level stand-alone rainwater harvesting systems (source: www.rainsaucers.com) – this is a simplified version and the stand-alone roofs would be a much bigger design to serve a community rather than household (in order to collect more rainwater.*

Indicative activities for Output 2.b:

i. Commission design of innovation technologies and infrastructure and undertake independent feasibility assessment; identify/confirm intervention sites. An initial gender specific assessment will take place when designing through socioeconomic surveys, group consultation and negotiation, and through the use of participatory techniques. Consultation with the local people (both men and women) will be required in choice of technology, arrangement for local maintenance and construction, to determine the roles of men and women in local management and financing etc., for the sustainable operation and maintenance of the water scheme.
ii. Build and implement innovation demonstrations on spring boxes improvement (at least 5 demo sites);
iii. Design and run community training programmes for relevant communities. Gender issues will be appropriately highlighted throughout the entire training material;
iv. Document lessons learnt from this output and inject learning into policy debates and development (component 1).

Output 2.c: *Sustainable community reservoirs with 9 stand alone roof-top rainwater harvesting systems (in 3 hospitals and 6 schools), as well as 5 resilient gravity fed water distribution systems designed and pioneered in Kono, Kambia and Pujehun*

Focus of this project intervention would be the improvement partially already exiting community reservoirs e.g. at hospitals and schools, which are partially part of the Unicef and WASH consortium implementation of WASH activities. Focusing on rain water collection for drinking water usage in the dry season, the design of sustainable community reservoirs (Ferro-cement or steal, depending on the local circumstances) with stand alone roof-top rainwater harvesting systems, as well as gravity fed water distribution mechanisms will be pioneered. A proto-type design exists at Makeni hospital in Bombali district, where resident monks had established such a steal infrastructure several decades ago. Although this proto-type is no more functional, it adds a useful adaptation additionnality to other currently pursued designs.

Indicative activities for Output 2.c:

i. Conduct relevant assessments to determine feasibility, cost-effectiveness and due-diligence with respect to environmental, gender and other standards.
ii. Construct the sustainable community reservoirs with stand alone roof-top rainwater harvesting systems, as well as gravity fed water distribution mechanisms;
iii. Establish and train WASH management committees of at least 5 members, participation of women/girls ensured, to maintain community reservoirs;

Output 2.d: *At least 100 households provided with water storage and treatment systems for drinking water usage in times of prolonged dry-spells and drought in Kono, Kambia and Pujehun*

Initial vulnerability assessments were conducted in the three districts. The assessment found that communities are generally highly vulnerable to climate change (as related to the water sector), as a result of insufficient and outdated infrastructure (war-induced damages) and gaps in capacity.

Especially gender vulnerabilities have not always been taken into account. During PPG phase community consultations, perceptions were that especially women and children were most vulnerable to water supply constraints – and this is perceived to be exacerbated by climate change.

Current coping mechanisms are almost non-existent at the consulted pilot communities, with heavy reliance on surface water which makes communities vulnerable to diseases. The urgent need exists to rehabilitate existing infrastructure and construct new infrastructure as necessary. Especially gender sensitive and tailored technology innovations are urgently necessary.

Figure 6: *With the support of the Welthungerhilfe, two demonstration and training sites for community water supply techniques and technologies have been established. This project would further add a climate change additionnality component to the already existing innovations and use the centres as training venue for its pilot communities.*

Therefore appropriate climate resilient adaptation techniques for the water sector are being replicated, improved, tested and implemented at least in the six pilot communities identified. Adapting innovative technologies developed with the support of the Welthungerhilfe, a focus will be on water collection during the rainy season and storage for drinking water usage in times of prolonged dry-spells and drought. Hand-in-hand with the establishment of such technologies will be the establishment and training of WASH committees through the district staff of the MWR.

Following the well established replication strategy of the Welthungerhilfe, skilled community members (such as carpenters, and other) will be selected by the project (district MWR staff in association with local leaders, and based on the interest of community members) and will be enrolled in one month training courses at the established training centres at Grafting and Kenema being trained in the building, installation and maintenance of storage tanks, cisterns, and rain water harvesting platform, amongst other. The trained individuals would work in their villages and further afield to upscale the application of these technologies, as well as they would serve as trainers in the future. Trainees would be set up for establishing a new production line and skills that they could market commercially in the form of small enterprises.

Indicative activities for Output 2.d:

i. Assess the current condition of water storage and distribution mechanisms and investigate solutions (e.g.. community systems pioneered by the Welthungerhilfe) and make recommendations on the up-scaling of the most appropriate water storage and distribution at community level. The application of gender sensitive analysis and stakeholder participation will aid to choose acceptable technologies and design of effective management and financial systems.
ii. Provide water storage and treatment systems to at least 100 households;
iii. Set-up WASH committees, participation of women ensured, and training programme to support self-promotion of entrepreneurs who would be able to disseminate the climate resilient community water rainwater harvesting, supply and storage infrastructure.
iv. Track successes and failures and adjust support programme to communities accordingly and in an adaptive manner to ensure long-term sustainability of the investments and climate resilience impacts.

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

Complete Risk Log is included in Annex 1 of the project document. It includes risks identified in the PIF (see below) as well as newly identified risks. Additional barriers are included in the Barrier section above and are generally represented by the risks specified below. Most risks are organizational or strategic in nature, and mainly relate to relatively low current institutional and individual capacities of the public service structure in terms of adaptation. In summary, the following key risks were identified:

- Social resistance hinder the adoption of new resilient practices (PIF);
- Duplication and lack of coordination with other initiatives, resulting in inefficient use of resources, and a loss of opportunity for building climate change resilience in Sierra Leone (PIF);
- Limited capacity of local and national institutions (PIF);
- Reluctance of key stakeholders to endorse and participate in project activities (PIF);
- Too many different/divergent stakeholder interests in target sites may prevent efficient consensual decision-making (PIF);
- Stakeholder relations (PPG);
- Natural disaster: unusual and catastrophic climatic events during project implementation (PPG).

Mitigation measures for each risk are specified in the Risk Log (Annex 1), and have been systematically addressed in the project design.

A.7. Coordination with other relevant GEF financed initiatives

This project forms the foundation for a by the AfDB submitted PIF, which was cleared by GEF Secretariat in early February 2013. Close collaboration of the two projects is foreseen and reflected in the project design. Consultations with the UNDP led EWS regional project and specificallly its' Sierra Leone component took place during project preparation, and complementary support activities at Guma reservoirs in particular have been jointly planned. It is envisaged that the EWS project will feed information into the various policy dialogues planned under this intervention, making use of a mechanism established through this project. Collaborations with the local NGO EFA may also be jointly developed.

Consultations with IFAD and their specific GEF intervention in the agriculture and food security sector were undertaken, however, no specific interface points were identified.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1 Describe how the stakeholders will be engaged in project implementation.

A stakeholder matrix is included in section 1, table 2 of the project document. The following stakeholders are envisaged:

Water Department, Ministry of Water Resources: Overall Project Implementation. A Project Implementat attached to WD will be set up to coordinate and direct project execution in Freetown. District WASH coor and support staff will be the key executers of the district and local level activities with relevant NGOs and indi

Sierra Leone Environment Protection Agency: Parts Component 1 coordination in partnership with Mi Resources Resources GEF and UNFCCC Focal Point. Steering Committee Chair of Project Implementation.

National Climate Change Committee :Partnerships with EPA on various components, project beneficia

knowledge and information portals created.

Ministry of Economy, Planning and Cooperation: Aims to assist mainstreaming, climate considerations into and other country key planning documents and also strengthen competency in resources mobilisation

Ministry of Finance and economic Development: Responsible for coordination of cooperation initiatives.

Meteorological Department: Partner for EWS and information /knowledge generation activities under compon

Local Government in Freetown, District Councils in Kambia, Kono and Puhejun: Contribution to the imp project activities at least at two villages per district; overall strategic guidance.

Beneficiaries from capacity support activities, building district level capacities in dealing with climate change.

Environmental Foundation for Africa (EFA): EFA has recently set up a environmental and sustainability lear Lakka in Freetown. Modern and inspiring infrastructure is available for hosting trainings, demonstrations of t political dialogues. Capacities for developing cutting edge learning approaches for a suite of stakeholders thr partnership with the IUCN Commission on Education and Communication exists, which can support content modules.

Sierra Leone Business Forum (SBLF): Platform for policy dialogues especially with the private sector under cor

Innovation training centres at Grafting and Kenema: Demonstrations of water supply and management innova for adaptation additions; training of replicators from the local communities in the three project districts

Local NGOs and consulting services esp. at the district level: Support to project implementation in all districts

Pilot sites: Pujehun: Bandajuma Sowa,Gbondapi, Kono: Koeyor community Jaima Sewafe Chiefdom, Ka Chiefdom, Malambay: Primary beneficiaries and partners in local level testing and implementation of climate rainwater harvesting technologies, storage and management.

Communities, Women and Youth Associations, CBOs: Beneficiaries of adaptation measures and contribution t managing of small scale water supply systems. Form part of policy formulation.

Private sector (the Guma Valley Water Company, Provincial Water Company (PROWACO), Small Water pro the establishment of framework for policies and supports in promoting investment and entrepreneurship adaptation, designing of climate resilient design, build climate resilient water harvesting schemes), Guma Val benefit from improved monitoring system

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

The incorporation of climate change risk management principles into policy and policy processes is done with the expectation that it will incentivize and lead to the identification of new development priorities, revised strategies, evolution of supportive by-laws, and law enforcement mechanisms, as well as monitoring and evaluation frameworks. The adoption of a long-term climate strategy will enable national authorities to plan and sequence adaptation actions, fully taking into account the long lead-times between investments decisions made today and realizing the beneficial impacts of those investments. Climate management is a long-term process, and therefore the implementation of the strategy must be seen as a reiterative, continuous learning process.

At a local level, LDCF funding will reduce the vulnerability of communities in 4 districts in Northern, Eastern, Southern and Western regions. The LDCF financed initiative will enable the GoSL to address important investment gaps in community-based climate risk reduction by promoting climate-resilient water harvesting, storage and distribution systems in vulnerable households and public services (schools, hospitals).

This is a vital contribution towards helping Sierra Leone to advance progress on MDG 7 targets. Through the demonstration projects in Fretown and the three districts, namely Puhejun, Kono and Kambia more than 20,000 people (as relfected by households in the intervnetion areas – see project site description) will benefit from dry season drinking water supplies, generated from innovative RWH technologies. As this addresses a major concern of local people, as indicated during the local level community consultations, it is assumed that the socoi-economic benefits derived from such support will be significant. In the districts a guild of water infrastructure handimen will be trained in estbalishing low-cost household level RWH infrastructure and storage facilities. There is potential for these handimen to develop small enterprises for replication of the technologies, providing income opportunities for them. LDCF resources will help to foster improved awareness in communities about the impacts of climate change and enable access of risk and early warning information by disadvantaged and marginalized groups.

Gender and the specific role of women in the use and maintenance of village and household level infrastructure, specifically water provisioning infrastructure and measures to mitigate disaster risk, is a critical element that the proposed initiative will promote. The project will ensure that all key outputs take account of the specific gender related concerns, such as the linkages between women and children and natural disasters and differences in access to key infrastructure between men and women.

Under component 1, the project will enhance women's leadership skills and offer opportunities to influence decisions. Information about climate change and adaptation measures will be designed and disseminated to ensure that women and girls – especially those who are poor or have been denied the right to an education – can easily have access to and absorb the necessary information. Gender specific information elements ought to be integrated into such materials, as gender sensitive analysis and planning is an important aspect of effective climate risk planning and response.

implementing partner and communities will ensutre that gender concerns will be mainstreamed when designing soft and hard adaptation measures. Women's participation in the design adaptation measure, for example water systems, will ensure that their needs are met and that their constraints are addressed. By promoting affordable climate-resilient community based water harvesting capture, storage and distribution systems (Component 2), the project will cut time spent by women and girls in collecting water from one hour/trip to 15 mins/trip by 2017 and reduce incidence of water borne diseases by 60%. The reduction in workload will also improve women's health and enable girls attend school more regularly. The provision of water facilities in schools (Output 2c) will reduce the risk to sexual violence girls face when fetching for water and as they attend to nature's call in the bush or neighbouring houses. Time saved in collecting water and caring for the sick would be invested into other activities.

In addition, as women constitute 50% of the members of Water Management Committees and Water User Associations, they will be provided with training to improve their confidence and management skills. Men and boys will be sensitised to improve their participation in water management activities at the household and community levels.

B.3. Explain how cost-effectiveness is reflected in the project design:

In order to respond to the greatest and most immediate threats of climate change, the GoSL prepared a National Adaptation Programme of Action (NAPA), which prioritized a number of interventions that should enhance the adaptive capacity of the water sector e.g. institutional strengthening of the water resources sector, promotion of rain rater harvesting, development of An Integrated Management System for Fresh Water Bodies, etc. The proposed interventions outlined in this LDCF project are based on the NAPA priorities weighed for cost-effectiveness and sustainability, before the proposed project components were selected and

elaborated. By systematically building climate change resilience in the water sector, long-term costs that would most probably incur due to inappropriate planning and assumptions that do not factor in future climate impacts are foregone. Cost-effectiveness of water-sector investments is thus generally supported. The suggested outputs, activities and approaches have been identified and selected to meet the project objective and its expected outcomes in a cost-effective way.

Outcome 1-As part of the project development, a review of the water related policies on water resources management and related to climate change was undertaken (cf. PPG Report 2). The objective of the review was to assess whether water related policies are sufficient to deal with impacts of climate change, and suggest how to best align climate change issues into policies. The results, from the policy analysis and key discussions with the Ministry of Water Resources, Guma Valley Water Company and partners (AfDB & DFID), suggested to integrate climate change adaptation within current policies such as the National Water and Sanitation Policy (NWSP) and its implementation Plan, the Rural Water Supply Strategy and into the management of the Guma Valley reservoir, along with training and raising awareness of decision makers and other key stakeholders. The project will invest 700,000 USD to allow planning for climate change risks in an efficient way, providing with policy and institutional capacities with a moderate investment. In addition, dialogues undertaken with Private sector will contribute to improve the role of government in enabling and incentivizing the private sector to take action in adaptation. Furthermore, the budget will support the dissemination and management of lessons learned from the project, so that all Sierra Leones have a better understanding of climate change issues in the water sector and guidance on what practical solutions will suit each specific site.

Under Outcome 2, a number of adaptation options have been assessed during the project design through documentation review, consultations at the national and local levels, and sites visits in every chiefdom that helped to determine the most appropriate technologies that are resilient against climate change induced risks in Freetown and Puhejun, Kambia and Kono districts. Priority adaptation technologies in the water sector identified by stakeholders were the following: (i) in Freetown, some households are applying rooftop rainwater harvesting techniques to complement water supply at a household level, current springs are also utilised but they are badly maintained, over utilised and often even vandalised resulting in poor quality and sufficiency in water; in the rural areas, communities currently rely strongly on the few open surface wells which are often riddled with water borne diseases, or have to rely on springs, which periodically dry up. Some, innovative technologies already on-going, with low-cost and safe household level water pumping, purification and storage but with no specific climate resilience considerations. After careful and in-depth analysis, it has been decided to focus on water collection during the rainy season and storage for drinking water usage in times of prolonged dry-spells and drought. These options have been selected on the basis of their potential for increasing resilience of water system.

With an investment of $2,000,000, the project will support the building of 100 water storage and treatment systems, 12 innovative climate resilient rainwater collection in public buildings, and rehabilitation of about 10 spring water benefitting at least 30,000 people (50% of whom should be women). These investments will also allow the 30,000 beneficiaries to satisfy their domestic water needs estimating by the UN to 50 liter/day/person[11].

The project will test new innovations for roofing toward rainwater harvesting to create a collecting mechanism for clean water. The construction of a rooftop rainwater catchment system is simple, and local people can easily be trained to build one, minimizing its cost. It provides an essential reserve in times of

[11]The Institute Water for Africa : http://www.water-for-africa.org/en/water-consumption.html.

emergency and/or breakdown of public water supply systems, particularly during natural disasters. Running costs are low and construction, operation, and maintenance are not labour-intensive.

Local communities have used springs boxes as a source of water supply for many years. Water quality will be improved and very low operation and maintenance costs, coupled with the ease of community management, make them quite effective for supplying rural communities with water for domestic purposes. Protecting these water sources from contamination is a natural way of ensuring the continuity of this supply. Spring protection is an inexpensive in comparison to the development of a conventional point source.

Finally, district level water engineers (from both the public and private sector), NGOS, local community based management committees, youth and women associations and others jointly and in a participatory approach work together as learning partners and engage in meaningful dialogues on climate risks, needs assessments and planning responses, to ensure that functional and long-term solutions to the impeding climate risks in the water sector are being set up, including through community-based water management approaches.

C. DESCRIBE THE BUDGETED M &E PLAN:

The project will be monitored through the following M& E activities. The M& E budget is provided in the table below. The M&E framework set out in the Project Results Framework in part III of this project document is aligned with the AMAT and UNDP M&E frameworks.

Project start: A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan. The Inception Workshop should address a number of key issues including:

a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.

b) Based on the project results framework and the relevant GEF Tracking Tool, in this case the LDCF related AMAT set out in the Project Results Framework in section III of this project document, and finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.

c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.

d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.

e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Managment Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically

classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).

- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually: Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR
- Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

Mid-term of project cycle: The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (insert date). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC). The relevant GEF Focal Area Tracking Tools (in this case LDFC AMAT as set out in the Project Results Framework in section III of this project document) will also be completed during the mid-term evaluation cycle.

End of Project: An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC). The relevant GEF Focal Area Tracking Tools (in this case LDFC AMAT as set out in the Project Results Framework in section III of this project document) will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results

may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Periodic Monitoring through site visits: UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

Learning and knowledge sharing: Results from the project will be disseminated within and beyond the project intervention zone 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 project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

M& E workplan and budget

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Inception Workshop and Report	▪ Project Manager (MOA) ▪ PIU ▪ UNDP CO, UNDP GEF	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members. ▪ PIU, esp. M&E expert	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on *output and implementation*	▪ Oversight by Project Manager (MOA) ▪ PIU, esp. M&E expert ▪ Implementation teams	To be determined as part of the Annual Work Plan's preparation. Indicative cost is 20,000	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	▪ Project manager (MOA) ▪ PIU ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG	None	Annually
Periodic status/ progress reports	▪ Project manager and team	None	Quarterly
Mid-term Evaluation	▪ Project manager (MOA) ▪ PIU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation	Indicative cost: 30,000	At the mid-point of project implementation.

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
	team)		
Final Evaluation	▪ Project manager (MOA) ▪ PIU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost : 45,000	At least three months before the end of project implementation
Project Terminal Report	▪ Project manager ▪ PIU ▪ UNDP CO	None	At least three months before the end of the project
Audit	▪ UNDP CO ▪ Project manager (MOA) ▪ PIU	Indicative cost per year: 3,000 (12,000 total)	Yearly
Visits to field sites	▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 117,000 (+/- 5% of total GEF budget)	

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter(s) with this form. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Mr. Kolleh BANGURA	Director	Environment Protection Agency	06/09/2011

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	**Signature**	**Date** ***(Month, day, year)***	**Project Contact Person**	**Telephone**	**Email Address**
Adriana Dinu, Officer-in-Charge and Deputy Executive Coordinator, UNDP/GEF		November 11, 2013	Mrs. Mame Dagou DIOP, RTA, Africa	+27 12 354 8115	mame.diop@undp.org

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:
Expected CP Outcome(s): Policy framework and institutional arrangements for managing natural resources and addressing climate change, disaster, and environmental management strengthened
Transitional Joint Vision for Sierra Leone of the United Nations Family (2013-14): Cluster 3 goal: To ensure that natural resources are sustainably and equitably managed and threats and impacts from natural and man-made disasters are reduced

Country Programme Outcome Indicators:
Transitional Joint Vision for Sierra Leone of the United Nations Family (2013-14): Cluster 3 indicators:
(1) Percentage change in mortality and casualties and economic impacts of natural and man-made disasters compared to 2011
(2) Percentage change in Sierra Leone's environmental performance index as compared to 2010 (as measured by UNDP's Human Development Reports)

Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): 1. Mainstreaming environment and energy OR
2. Catalyzing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.

Applicable GEF Strategic Objective and Programme: Adaptation to Climate Change: Objective 1: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level and Objective 2: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level

Applicable GEF Expected Outcomes: Outcome 1.1: Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas, Outcome 1.2: Reduced vulnerability in development sectors, Outcome 2.1: Increased knowledge and understanding of climate variability and change-induced risks at country level and in targeted vulnerable areas, Outcome 2.3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level, Outcome 3.1: Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas

Applicable GEF Outcome Indicators: (following AMAT tool)
Indicator 1.1.1: Adaptation actions implemented in national/regional development frameworks.
Indicator 1.2.3: Number of additional people provided with access to safe water supply and basic sanitation services given existing and projected climate change
Indicator 2.2.1: No. and type of targeted institutions with increased adaptive capacity to reduce risks of and responses to climate variability.
Indicator 2.3.2: % of targeted population awareness of predicted adverse impacts of climate change and appropriate responses

	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
Project Objective[12] E*nhance the adaptive capacity of decision-makers in the public and private sector involved in water provision to plan for and respond to climate change risks on water resources.*	Indicator 2.2.1: No. and type of targeted institutions with increased adaptive capacity to reduce risks of and responses to climate	Technocrats from MWR and EPA in Freetown, but particularly regional technical staffs have extremely limited opportunity for professional updating, and usually find it difficult to address newly emerging technical issues and practices into their	At least capacities of 2 line ministries and 2 Districts Council to mainstream adaptation concerns within water policies and local development plans are strengthened; and capacities	Baseline capacity assessment to be undertaken at project onset APRs/PIR Policy reviews as part of APRs/PIR	Unavailability of requisite human resources and data Insufficient institutional support and political commitment

[12] *Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR*

(equivalent to output in ATLAS)	variability. (AMAT indicator 2.2.1)	ongoing work. One of the major limitations is the lack of capacity to deal with climate risks and understandings of managing these risks in the water sector.	of two research /training center to deliver relevant trainings on climate change issues of are strengthened.	MTR	
Outcome 1[13]: Critical public policies governing the management of water resources revised to incentivize climate smart investment by the private sector. **(equivalent to activity in ATLAS)**	Indicator 1.1.1: Adaptation concerns and actions mainstreamed within at least the Guma Reservoir Management process (AMAT indicator 1.1.1)	The overall risk that climate change may pose on the sustainability of water supply to the capital not well integrated into Guma Reservoir management;	CC resilience plan for Guma reservoir established	Policy and resilience plan review Policy reviews as part of APRs/PIR	Timing of interventions well attuned to policy development/review; Political will is lacking
	Indicator 2.2.1: No. and type of targeted institutions with increased adaptive capacity to reduce risks of and responses to climate variability. (AMAT indicator 2.2.1)	Key decision-makers who are supposed to lead the implementtaion of the policy have limited knowledge of climate change impacts or adaptation responses. Information, including inventory and mapping, is inadequate and staffs from MWR have limited expertise to internalize climate changes into existing local deve plan Low interplay between public and private sector on adaptation strategies investment Existing coping strategies and adaptation action not documented at all, including for the water sector.	15% of staff from targeted institutions aware of predicted impacts of climate change and appropriate responses 60% of targeted stakeholders have access to relevant disseminated adaption experiences from the project	Baseline capacity assessment to be undertaken at project onset Awareness raising activities Policy reviews as part of APRs/PIR	Insufficient institutional support and political commitment
Outcome 2: Water supply infrastructure in Freetown and Puhejun, Kambia and Kono districts made resilient against climate	Indicator 1.2.3: Number of additional people provided with access to safe water supply and basic sanitation	Type and level: 0 (aside already existing local coping mechanism)	5.000 at intervention sites in Freetown and three districts	Project reports e.g. trainings, pilot interventions, APRs, PIRs Local level assessments at demonstration sites	Target population do not see the benefit of new practices or social conflicts hinder taking up the practices; Low Capacities of WASH

[13] *All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.*

change induced risks. **(equivalent to activity in ATLAS)**	services given existing and projected climate change (AMAT indicator 1.3.1.1)			(Questionnaire based appraisal - CBA) APRs/PIR	comities to support the implementation of appropriate climate resilient technologies

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

Agencies comparative advantage: 3. Is the Agency's comparative advantage for this project clearly described and supported?	In addition to the clarifications provided at PIF stage, it should be pointed out that the project design is strongly focused on capacity development. Investments i.e. of the AFDB in three pilot districts are used as baseline project for this adaptation intervention. All interventions are now TA interventions, with investments reduced to a demonstration scale. Innovations for RWH, responding to a specific climate and potentially climate change related risk of drinking water shortages in the dry season is targeted. Consultations with DFID and the through them supported WASH Consortium were undertaken during the PPG phase. However, it was jointly decided at the inception workshop to work in three districts which will fall under the AFDB (DFID is not active in these regions). In Freetown some work on the Mamba Ridge Community Reservoir, supported i.e. by the WASH Consortium member Action Contre la Faim may interface. The Ministry of Water Resources, executing agency for this project, also houses the WASH PIU. The Ministry will be responsible for donor coordination. Technical exchanges will be facilitated by activities under component 1of this project, in particular.
Project consistency: 7. Is the project aligned with the focal /multifocal areas/ LDCF/SCCF/NPIF results framework?	In addition to the response to the initial PIF, dedicated AMAT indicators for the suggested outcomes have been integrated into the project design.
Project design 11. Is (are) the baseline project(s), including problem (s) that the baseline project(s) seek/s to address, sufficiently described and based on sound data and assumptions?	During the PPG phase the baseline project(s) have been further refined and described. Additionally, the demonstrations i.e. under Component 2 of the project focus on pioneering RWH innovations, responding to a specific climate and potentially climate change related risk of drinking water shortages in the dry season is targeted. As such the focus is more refined than "water provision" per se.
14. Is the project framework sound and sufficiently clear?	Further alignments of outputs and project activities have taken place. The Investment component has been removed and has been transformed into a TA component focusing on capacity building, in line with UNDP's comparative advantage. The project focus is also geared towards reducing risks (people, economic) caused by natural (and human made) disasters – in line with the UNDP mandate under the Transitional Joint Vision for Sierra Leone of the United Nations Family.
17. Is public participation, including CSOs and indigenous people,	Specific consultations have taken place during the PPG phase, at national, district and community level. Based on local level climate risk and vulnerability information relevant to the water sector, local level demonstration interventions have been

taken into consideration, their role identified and addressed properly?	designed, responding to key needs voiced by the local people. The design allows for local level ownership and participation. Gender specific concerns are specifically considered and will be follow-up on during implementation. A national NGO, Environmental Forum for Africa (EFA) has been identified as a key collaborator for national level capacity development and policy dialogue activities. It is envisaged that local NGOs will support project implementation at district level.
18. Does the project take into account potential major risks, including the consequences of climate change and provides sufficient risk mitigation measures? (i.e., climate resilience)	The coordination risk has been specifically addressed during the PPG phase through intensive consultations. The AFDB opted to submit a follow-on PIF to the GEF, to up-scale the joint activities and outcomes foreseen from this specific project. MWR has the responsibility to facilitate donor coordination in the water sector and the Ministry has taken full ownership of this specific project intervention. Component 1 of this project entails activities that will facilitate such a coordination element on a technical and a policy level.
19. Is the project consistent and properly coordinated with other related initiatives in the country or in the region?	Yes, a detailed review and consultations have taken place during the PPG phase. Specific site selection (districts) undertaken with MWR and AfDB. The project has been designed to create learning and technical capacities of water sector professionals at district level that can be applied directly the AfDB interventions. Strategic partnership with the EU Project on environmental governance executed by EPA for policy level component activities; A strategic partnership with the GUMA Valley Water Company, as well as the UNDP implemented EWS project that is aiming to establish a EWS monitoring system for the Guma Reservoir and an UNDP support to the WASH programme mostly financed through DFID. The UNDP component provides technical support to the Met Service to provide better weather and climate information to WASH operations. Consultations with IFAD and their specific GEF intervention in the agriculture and food security sector were undertaken, however, no specific interface points were identified.
Project Financing	The financing arrangements have been slightly changed with all project costs now allocated to TA interventions. It is noted that the overall project management cost have been increased by US$ 117,000 – for the implementation of the M&E plan.
Recommendations at PIF Stage 1. Items to consider at CEO endorsement/approval.	See all the above

Comments by Germany on LDCF PIF Sierra Leone: *Building Adaptive Capacity to Catalyze Active Public and Private Sector Participation to Manage the Exposure and Sensitivity of Water Supply Services to Climate Change*

Comment	**UNDP response at PIF stage**	**UNDP response at CEO Endorsement submission stage**
1) The expected output **d** of component 2 states that relevant	*A dedicated knowledge management, communication and awareness strategy will be developed and*	Specific activities in support of knowledge management and sharing of lessons learnt

experiences/lessons will be "widely shared/disseminated" but no details are provided in the PIFWe request that further details, mechanism or procedures are outlined on how this essential output is intended to be achieved.	*implemented to support learning and exchange beyond the lifetime of this particular project and serve the needs of other similar initiatives currently underway or likely to emerge in the future (replication of project best practices). A communal network and platform for sharing experiences in CBA projects as well as a project closure seminar for systematization and communication of the project's lessons will be organized for this purpose. In addition, the project plans to use local media (widely diffused radio programming and a televised report) to inform local populations on the effects of climate change envisaged adaptation measures and results. Guides on best practices in CBA published in local languages will be disseminated to facilitate appropriation of the tools developed by the project. Details on mechanisms and procedures will be outlined in the project document at CEO endorsement.*	are included in the project design, mainstreamed throughout various formulated outputs. Lessons learnt will particularly be shared and discussed amongst key target groups from the public and private sector in Sierra Leone. By associating with the EFA learning Centre at Lakka an additional mechanism for sharing of lessons through the established environmental centre are foreseen.
2) Under component 1 (on page 9) a regular dialogue is proposed in at least 5 local councils and it is stated that this number has been deemed necessary in order to mainstream climate change risk assessments into development frameworks. In contrast, in the project framework (on page 2) it says "at least 3 local councils". We therefore recommend adjusting the relevant numbers to achieve coherence.	*It is proposed that the project intervene in Freetown and in at least 3 rural districts in Northern, Eastern, and Southern regions. During the project preparation phase, the specific regions and sites for intervention will be identified based on clearly defined criteria (including vulnerability to climate change including variability as a priority). A full assessment of the location specific risks facing the selected community/ies will be undertaken to inform the project design. A participatory stakeholder approach to site selection and to develop interventions will be employed and outlined in the UNDP project document.*	Intervention districts were identified and agreed to during the PPG phase inception workshop attended by over 50 individuals in Freetown. Subsequent site selection took place based on climate risks and vulnerabilities, combined with recommendations from the district WASH coordinators of the MWR and Council representatives. In-depth community consultations took place during the PPG phase to establish willingness to participate as well as climate and water sector related parameters, such a climate risk to water availability, adaptive capacities and other.

Comments by <u>US</u> on LDCF PIF Sierra Leone: ***Building Adaptive Capacity to Catalyze Active Public and Private Sector Participation to Manage the Exposure and Sensitivity of Water Supply Services to Climate Change***

US Comments	UNDP response at PIF stage	UNDP response at CEO Endorsement submission stage
1. We would encourage the project to put a stronger emphasis on improving not just **access** to water (either by decentralized harvesting or more efficient/equitable infrastructure, as the project puts forth), but also the **quality** and **safety** of the water, especially in the face of changing climate conditions which may add unforeseen strain on	During the design of climate-resilient community based water harvesting, storage and distribution systems, attention will be paid on water quality & safety. In Sierra Leone, UNDP is involved with UNICEF in several water programmes (e.g. Community Empowerment and Development Project) and discussion will be engaged during the preparatory phase to coordinate educational efforts.	The proposed RWH technologies are specifically targeted at providing drinking quality rainwater to overcome dry season shortfalls. During the implementation of the project further safeguards will be discussed, depending on the finally agreed to water usage per site.

US Comments	UNDP response at PIF stage	UNDP response at CEO Endorsement submission stage
this aspect of the water system. Improved water quality resilience can be achieved with infrastructure upgrades in coordination with targeted educational outreach to vulnerable populations, for instance supplying knowledge on how to both prevent contamination and deal with lower grade water (i.e. with point-of-use practices).		
2. Several of the activities under Component 1 involve increased access to data or establishment of data collections systems. Establishing and maintaining a climate monitoring system is an extensive undertaking. Please elaborate on how access to climate monitoring data and/or maintenance of data collection systems will be sustained after the project finishes.	The meteorological Department will be responsible for the management of data provided by the project. As institutions sisters in the sub region, the Department could establish a services provider system allowing them to update and maintain data collections.	The related output has been removed from the project strategy, as another GEF funded and UNDP facilitated initiative on EWS as well as on-going UNDP support under the DIFD support to the water sector in Sierra Leone support similar activities already.
3. How will the project ensure that the knowledge and expertise conferred during the training referred to in Component 1 will be institutionally retained and passed down to new or expanding government staff?	Preparatory phase resources will help to analyse/assess the country institutional capacity and link project training to existing/planned capacity building strategy/plans.	Specific capacity planning is integrated into the project design. Further the institutionalisation of training and awareness activities at the EFA Lakka Environmental Learning Centre (a local NGO) will provide a strategic sustainability linkage, as the centre can provide trainings to future trainees from the water sector on a demand basis.
4. Will the stakeholders targeted under Component 2 for capacity development be engaged in the designing, building, and/or rehabilitation of water catchment systems in Freetown and the rural districts? This process seems like an excellent opportunity to provide direct experience with addressing climate risks through small-scale water supply solutions.	Capacity of more than 50 Water engineers (from both public and private sector), local community based management committees, youth and woman associations developed in designing and managing climate risks on small-scale water supply systems, as well as maintaining climate-resilient infrastructure. UNDP is already experiencing such process under the CDAP project with the training of twelve (12) community plumbers, from Bumbuna, Mapaki and Kabumban communities for the maintenance of the Gravity –fed water systems in partnership with the Ministry of Energy and Water Resources (MEWR), UNICEF and Muloma Women's Development Association (MUWODA).	Yes, both under component 1 and component 2 relevant outputs and activities have been formulated to address this comment. Firstly small scale RWN solutions are being promoted, and trainings of relevant water engineers, but also potential RWH infrastructure entrepreneurs in the three rural pilot districts (Kono, Kambia, Puhejun) and in Freetown are foreseen. Close collaboration with the community training centres at Grafting and Kenema (supported by the Welthungerhilfe) will add to this. The link to the EFA Learning centre in Lakka provides further demonstrations, which will be shared with many different target

US Comments	UNDP response at PIF stage	UNDP response at CEO Endorsement submission stage
		groups in Sierra Leone and internationally.
5. We are pleased that the project addresses the issue of gender. We hope project activities, particularly those associated with capacity building and training, will be proactively designed to include equitable representation of both genders. This concern also applies to other issues of representation, i.e. geographic, ethnic, etc. A number of past projects have been implemented with a gender component; can the project elaborate on any models that could be applicable to this project?	During the project preparatory phase a socioeconomic/gender specialist will be hired to (i) identify social groups that are particularly vulnerable to climate change; (ii) conduct gender sensitive assessment of adaptation options and provide gender sensitive indicators (ii) Evaluate current coping strategies for effectiveness and sustainability; and identify priority adaptation issues in the target area, and to develop strategies to address these issues at household/individual levels.	Relevant local level assessments were undertaken during the PPG phase and gender sensitive formulation of project activities have been specifically integrated throughout the project design.
6. Please elaborate on how this project will collaborate with the numerous parallel efforts underway. For example, the United States participates in the Sanitation and Water for All initiative in Sierra Leone, along with a number of other donors. There may be a coordinated donor effort to assist Sierra Leone with national planning for sanitation and drinking water supply. How does the project envision coordinating its planning activities with Sanitation and Water for All's work with Sierra Leone?	The project will be coordinated by the Ministry of Water and Energy, which already established coordination mechanisms among national and international partners. It is expected that the Water Policy Planning, Coordinating Unit (WPPCU) will be an important coordination mechanisms. In addition, better programmatic coordination with development partners (IFAD, WB, UNDP, DFID and EU) will be ensured through coordination mechanisms established by the UN Join vision and by giving periodically information about project progress and tools.	MWR is the executing agency for this project. As this Ministry is tasked with the coordination of all water sector related projects in the country, they will take on a coordinating role. In fact the MWR took excellent leadership in this regard during the PPG phase, already. Consultations with a great variety of water sector actors took place during the PPG phase, and linkages have been established also for the project implementation phase.

Baseline Initiatives	Add Value
The European Commission (EU) *'Environmental Governance and Mainstreaming Project'*	The EU Project on environmental governance is used as a vehicle to mainstream climate change considerations into the WASH policy as a prerequisite for enabling more climate smart investment. As part of advancing this key result, LDCF resources are dedicated in part to finance the provision of relevant climate information and train government agencies to scale-up efforts to address climate change in water policies.

Partners investments in the water and sanitation sector, including: **Gov. of Sierra Leone** **DFID** "Water Supply, Sanitation and Hygiene Promotion in Schools, Clinics and Communities in rural Sierra Leone" project; **World Bank** Emergency rehabilitation and improving water and sanitation services **Action Contre la Faim** "Community water harvesting exists in Mamba Ridge, Thunder Hill and Blue Cemetery Communities", etc.	Water sector planning and monorting tools/system will be improved. Effective climate risk assessment and contingency planning for Guma Reservoir will be established, based on improved monitoring systems. This will secure pre-planning for water access and also help towards building an Early Warning System. Also, the Water Point and Groundwater mapping tools will be up-dated to adapt them to new aspects of climate changes developments by taking account both vulnerability to climate changes (determined by engineering and environment) and adaptive capacity (ability to be adjusted or managed so as to cope in response to different climate conditions). Relevant adaptation technologies will be transferred to relevant communities. In Freetown, innovations for supplementing current water supply through rain water harvesting and securing small sources as well as one larger source will be pioneered. Affordable climate-resilient community based water harvesting capture, storage and distribution systems will have been designed and built on a demonstration basis. More than 100 households in Freetown will have more secured and climate resilient access to water for household and community uses. The beneficiaries are fully aware of related water and climate risk management matters and are in a position to manage and maintain them effectively. Appropriate climate resilient adaptation techniques for the water sector are being replicated, improved, tested and implemented in the three pilot districts. Working with at least six communities identified by the District councils and district level WASH supervision officers during the project preparatory phase (Pujehun: Bandajuma Sowa, Gbondapi, Kono: Koeyor community Jaima Sewafe Chiefdom, Kambia: Mambolo Chiefdom, Malambay – see Situation analysis) climate resilient local level water supply and storage systems will be pioneered in these sites. Adapting already existing innovative technologies, a focus will be on water collection during the rainy season and storage for drinking water usage in times of prolonged dry-spells and drought. Hand-in-hand with the establishment of such technologies will be the establishment and training of WASH committees through the district staff of the MWR. More than 200 households will benefit from this targeted dry season water supply.
The **Sanitation and Water for All** Partnership (SWA) was launched in 2010. It brings together developing countries, donors, multilateral agencies, civil society and other sector partners to work towards universal access to sanitation and drinking water, through coordinated action at the global and national levels.	Under the SWA, the Government of Sierra Leone commits to • *Increase resources for WASH through effective monitoring, as well as a central climate communication and information system, will also aid planning and policy development in an integrated and climate smart manner:* As part of advancing this key result, LDCF resources are dedicated in part to finance the provision of relevant climate information and train government agencies to scale-up efforts to address climate change in water policies. The envisaged bottom-up approach in which dialogues are formed between all decision-makers will also create a platform in which planning can be conducted based on vulnerabilities within the water sector to climate change. The GEF project will specifically enhance understanding of climate resilience and risk management for effective integration of climate risk into planning and policy development. Effective monitoring, as well as a central climate communication and information system will be provided and aid planning and policy development in an integrated and climate smart manner. • *Work with communities:* District level water engineers (from both the public and private sector), NGOS, local community based management committees, youth and women associations and others jointly and in a participatory approach work together as learning partners and engage in meaningful dialogues on climate risks, needs assessments and planning responses, to ensure that functional and long-term solutions to the impeding climate risks in the water sector are being set up, including through community-based water management approaches. • *Monitor and regulate sector performance* The capacity building initiatives of both technical staff and decision-makers will enhance

	understanding of climate resilience and risk management for effective integration of climate risk into planning and policy development. • *Deepening civil society engagement, defining gender, increasing the role of the private sector and improving sector knowledge and learning.* Policy roundtables and other relevant information sharing platforms will be put into place to support a national and regional debate on climate change and to generate better understanding of the climate risks as well as adaptation options for the water sector. Technocrats, policy makers, private sector, donor organisations, national and international NGOs will be targeted to be part of such knowledge exchanges. Lessons learnt from project will also be integrated into such debates, ensuring that best practices can be replicated and further up-scaled in the future. Therefore a participatory and gender sensitive engagement with the end users and the "deliverers" will be established by this project, in line with the WASH policy and under leadership of MWR. Gender focuses and considerations in capacity building approaches with regard contextual gender differentiation of roles and responsibilities at community level will go a long way in efficient project implementation.

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[14]

A. DESCRIBE FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION, IF ANY:

B. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: **70,000**			
Project Preparation Activities Implemented	*GEF/LDCF/SCCF/NPIF Amount ($)*		
	Budgeted Amount	*Amount Spent To date*	*Amount Committed*
Activity 1: Needs assessment and technical feasibility of adaptation options and measures	35,000	32,915.35	402.31
Activity 2: Project Development	10,000	11,032.34	
Activity 3: Stakeholders consultation and engagement	10,000		10,000
Activity 4: Develop a financial plan and co-funding scheme	15,000	15,650	
Total	70,000	59,597.69	10,402.31

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

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

[14] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue 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.