United Nations Development Programme
Project Document template for nationally implemented projects financed by the Green Climate Fund (GCF)

Project title: *Supporting vulnerable communities in Maldives to manage climate change-induced water shortages*	
Country: *Maldives*	
Implementing Partner: *Ministry of Environment and Energy (MEE)*	**Management Arrangements :** *National Implementation Modality (NIM)*
UNDAF/Country Programme Outcome: *UNDAF outcome 4: By 2020, growth and development are inclusive, sustainable, increase resilience to climate change and disasters and contribute to enhanced food, energy and water security and natural resource management.*	
UNDP Strategic Plan Output: *1.4 Scaled up action on climate change adaptation and mitigation cross sectors which is funded and implemented*	
UNDP Social and Environmental Screening Category: *Moderate*	**UNDP Gender Marker for each project output:** *GEN 2*
Atlas Project ID/Award ID number: *00094293*	**Atlas Output ID number:** *00098433*
UNDP-GEF PIMS ID number: *5705*	**GCF ID number:** *FP007*
Planned start date: *9 May 2017*	**Planned end date:** *8 May 2022*
LPAC date: *12 April 2017*	

Brief project description:

The outer islands of the Maldives experiences drinking water shortages during the dry season. These shortages have had significant adverse human, environmental and social impacts on the outer island communities where 27% of population lives under the poverty line of US$2/per day. The key problems pertaining to freshwater security relate to the increasingly variable rainfall patterns induced by climate change and sea-level rise induced salinity of groundwater. As confirmed by the IPCC and RIMES reports, sea level rise of 3.1mm/year and decreasing rainfall amounts will considerably compound current water stress in the country. The Government faces constraints in responding to the challenge at hand without assistance, especially in the context of anticipated impacts of climate change. Firstly, the precarious fiscal status that confronts the Government limits the response options to this emerging crisis to largely reactive emergency measures. Longer-term solutions, without additional financial support, are out of reach. Secondly, a dispersed and small population on 186 islands prevents the possibility of economies of scale in providing water and sanitation services, including capital infrastructure.

In response to this climate challenge, the proposed project objective is to deliver safe and secure freshwater to

105,000 people in the islands of Maldives in the face of climate change risks. This will be achieved by delivering the following results:

a. Scaling up an integrated water supply system to provide safe water to vulnerable households;
b. Introduction of decentralized and cost-effective dry season water supply systems;
c. Groundwater quality improved to secure freshwater reserves for long term resilience.

The proposed adaptation solution is to maximize water production and scale up the use of an integrated water supply system that will bring three primary sources of water (rainwater, groundwater and desalinated water) into a least cost delivery system that is able to maintain service levels in the face of climate change related pressures. A paradigm shift will be achieved by addressing the main barriers to implementing integrated water supply systems (cost recovery; management capacity; and institutional mandates, coordination and policy direction). Replication potential is high considering the legislative mandate to provide clean water in the 2008 Constitution of the country. The project is based on national priorities and has been endorsed by the National Designated Authority for Maldives.

FINANCING PLAN	
GCF grant	USD 23,636,364
UNDP TRAC resources	USD 100,000
Cash co-financing to be administered by UNDP	-
(1) Total Budget administered by UNDP	**USD 23,736,364**
PARALLEL CO-FINANCING (*all other co-financing (cash and in-kind) administered by other entities, non-cash co-financing administered by UNDP)*	
UNDP	-
Government	USD 4,493,000
(2) Total co-financing	**USD 4,493,000**
(3) Grand-Total Project Financing (1) +(2)	**USD 28,229,364**

SIGNATURES		
Signature: Mr. Thoriq Ibrahim Minister of Environment and Energy	**Agreed by Government**	**Date/Month/Year:** 09/05/2017
Signature: Mr. Thoriq Ibrahim Minister of Environment and Energy	**Agreed by Implementing Partner**	**Date/Month/Year:** 09/05/2017
Signature: Ms. Shoko Noda Resident Representative	**Agreed by UNDP**	**Date/Month/Year:** 09/05/2017 .

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II. DEVELOPMENT CHALLENGE

Strategic Context (C.1 para 5-12)

Context: Poverty, Growth and Vulnerability

1. The Maldives consists of 1,190 small, low-lying coral islands clustered in 26 ring-like atolls, spread over a North-South axis across 90,000 square kilometres, with a population of about 399,000 spread over 194 islands[1]. With high-end tourism as the main driver of economic growth, the country has made a significant development progress and graduated from being a Least Developed Country in 2011. However, national aggregate indicators of progress conceal underlying disparities. There is spatial disparity between the capital, Male', and other atolls in human development indices[2]. The poverty headcount index, defined as the share of the population making less than MVR 18 (US$1.17) per person per day, for Male' has fallen from 23 % to less than 5 %; for the outer islands it has fallen at a lower rate, from 52 % to 25 % (UNDP, 2012). Spatial disparity is exacerbated by gender disparity; women in the atolls outside the capital are disproportionately affected by unequal opportunities.[3] On account of the spatial disparity, every 1 in 3 persons was living in the capital in 2014, where the most public services, including water supply are provided and their affordability is the most favourable.

2. The Maldives is a typical example of the "island paradox"[4]. Its relative prosperity through domestically generated income coexists with increasing vulnerability to external shocks[5] – including climate change, increases in global fuel prices or contractions of the tourism sector – and high structural costs due to its particular geographical characteristics. In large part, this is driven by the limits on land space and remoteness[6]. There are also high indivisible fixed costs on small island economies including policy and legislation formulation, regulatory activities, education, social services, justice, security, and foreign affairs. The Maldives is facing critical development challenges owing to a growing population and resource constraints. Longer-term impacts of urbanization are already happening including increasing water demand and pollution of naturally occurring, and very important, groundwater resources.

Context: Policies and Institutions

3. The legislative and policy basis for the provision of water supply and sanitation services in the Republic of Maldives is expressed though three main documents (*Constitution of the Republic of Maldives* (2008), the Manifesto of the Progressive Party of the Maldives (2013-2017) and the *Public Health Act* (2012). Legislation for the entire water sector (the Water Act) is forthcoming.

4. *The Constitution of the Republic of Maldives*, Article 23 states that every citizen has a right to "adequate and nutritious food and clean water", "the establishment of a sewage system of a reasonably adequate standard on every inhabited island" and that the "State undertakes to achieve the progressive realisation of these rights by reasonable measures within its ability and resources".

[1] Preliminary results of 2014 Population and Housing Census - revised, March 2014.
[2] For instance, a person living in Malé is likely to complete three years more of schooling than someone living in the atolls. The average income of a person living in Malé is nearly twice as high as that of a person living in the atolls. (2014 NHDR)
[3] The Gender Inequality Index in Malé is the lowest in the Maldives at 0.232. The rest of the country has higher values, peaking at 0.741 in Thaa & Laamu atolls, where men hold all the seats in parliament and where only 15.5% of women have at least secondary education. (2014 NHDR)
[4] http://unctad.org/meetings/en/SessionalDocuments/td451_en.pdf
[5] The Maldives produces less than an estimated 10% of its food requirements, and it is almost fully dependent on fuel imports to meet its transport and energy needs. The geographic dispersion of the country means there is no national grid connecting one island to another. As a result, the country is highly vulnerable to international fuel price fluctuations. In 2012, the Maldives spent USD 474.6 million on fuel-based imports (excluding bunker fuels), accounting for about 35% of GDP. Source: 2014 Maldives National Human Development Report (NHDR)
[6] World Bank (2014) Maldives: country snapshot, < https://www.worldbank.org/content/dam/Worldbank/document/SAR/maldives-country-snapshot-spring-2014.pdf >

5. The Manifesto of the Progressive Party of the Maldives (2013-2017) outlines a number of policy areas, aims and solutions. Water and Sanitation fall in Section G (of the GCF proposal) of this Manifesto. The aim for water supply solutions is to ensure safe drinking water for all. The solutions include providing safe water to islands that face water shortages during the dry season, through desalination; increasing the storage capacity of water in all islands; establishing desalination plants in islands with large populations; and establishing a faster system to provide water to islands in emergencies through regional storage and desalination of water. The aim for establishing effective sewerage systems is to eliminate the contamination of water. The solutions for sewerage systems are threefold: i) plan and implement sewerage projects in the islands; ii) introduce environmentally suitable models of sewerage to the Maldives; and iii) establish a system for sustainable maintenance of sewerage.

6. The *Public Health Act* contains sections related to water security, human rights obligations such as provision of essential water, quality assurance and regulations for implementing the Act (to be made by relevant institutions). It also has specific reference to rainwater tanks requiring protection from insects and animals. Although the Public Health Act addresses health concerns related to water quality, it is still in its infancy and the institutional arrangements for implementation of water quality monitoring to achieve stated health targets remain unclear.

7. In addition, recent restructuring of government towards decentralized authorities has implications for service delivery. The *Act on Decentralization of the Administrative Divisions of the Maldives, 2010* allows island communities to make their own decisions to improve living standards and to empower people by bringing the scope of services closer to them. There are 21 administrative divisions, including Male' City, each having its own council. Each outer island within each administrative division also has its own council of five elected members. The Act gives atoll and island councils wide powers, including:

a) Provision of water, electricity, and sewerage (S.24 e)
b) Collection of fees for services provided (S.8 i and S.78 a and b)
c) Supervision of the services provided by Divisions of Government Ministries (S.67)
d) Power to take on loans and issue securities (S.8 f and g)
e) Power to enter into service contracts for services to be provided under their authority (S.8 h)

8. The Government of Maldives (GoM) recently consolidated Utilities into 3 companies to serve the Maldives 186 inhabited islands. "FENAKA Corporation Limited" (FENAKA) is one of the Utilities (along with Maldives Water and Sanitation Company (MWSC) and STELCO) providing water, electricity, sewerage and solid waste services to the outer islands. FENAKA was formed in June 2012. GoM is also currently developing a comprehensive water policy – A Water Act – that will serve as an overarching national water policy to help the nation achieve the water and sanitation goals set forth in its constitution. The MEE spearheading an inclusive process of policy formulation to achieve consensus across various stakeholders, water-users and respective interests. It will embed the principles of integrated water resource management. It is therefore timely for the proposed GCF project to make conducive contributions in setting critical elements of the policy that will promote integrated approaches to water sector resilience.

Country Ownership (E.5)

Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs (E.5.1 para 120-122)

9. Section C.1 of the GCF proposal explains the legislative mandate provided the Country's Constitution to provide water and sanitation services for all of Maldives' citizens as their right. There are two sectoral pieces of legislation that also establish water and sanitation as priorities for the countries: the Public Health Act (2012) and the Water Act that is being drafted at the moment.

10. The country does have a Climate Change Policy Framework (2015), NDC (2015), NAPA (2007) and a Second National Communications (2016) that outlines adaptation priorities. The project will directly contribute to the

following country adaptation needs as outlined by the National Adaptation Programme of Action: (i) acquire appropriate sewage treatment and disposal technologies to protect water resources; (ii) increase safe rainwater harvesting; (iii) acquire desalination technologies appropriate for small islands; (iv) undertake recharging of aquifers to reduce salinization from saltwater intrusion and storm surge flooding; and (v) Protect and preserve natural water catchment and coastal areas..

11. Furthermore, the First National Communication of Maldives prioritizes the following adaptation measures in the water sector: (i) ground water protection and the introduction of appropriate technologies to sustainably extract water from the shallow groundwater lenses, including protection of water catchment areas and land allocation to facilitate groundwater replenishment processes; (ii) Increasing rainwater harvesting storage capacity; and (iii) Desalination. Desalination technologies that are currently used in the Maldives depend on fossil fuel. The introduction and use of alternative technologies, such as solar powered desalination, or desalination using waste heat from powerhouses, is an attractive option to mitigate the country's vulnerability to fluctuating oil prices.

Engagement with civil society organizations and other relevant stakeholders (E.5.3 para 130-131)

12. The proposed project is based on over 4 years of work in Maldives to address the issue of water shortages in the outer islands. Discussions have taken place in Male' with government officials and extensive consultations have been held with local authorities and the communities in several outer islands on finding effective solutions to the difficult challenge that confronts both communities and the government. Specifically, consultations and willingness to pay surveys have been conducted with support of Adaptation Fund on the islands of **Mahibadhoo (Alif Dhaal Atoll), Ihavandhoo (Haa Alifu Atoll) and Gadhdhoo (Gaaf Dhaal Atoll). These consultative and fact finding works have underpinned the design considerations of the proposed project.**

13. More recently, a series of stakeholder consultations was held upon the request of the MEE and supported by the UNDP in its capacity of accredited agency to the GCF. Four dedicated field mission were organized preceding the project formulation process. The first of these were in February 2015 where a UNDP technical team led by the Head of the Climate Change Adaptation Programming division met with Minister of Environment and Energy and technical personnel at MEE, including NDA to discuss Government needs and priorities with regards to climate change adaptation. A second mission was led by the Regional Technical Specialist, UNDP – Global Environment Finance Unit during the week of 30 March 2015. Extensive consultations were held with the main stakeholders, including the different relevant departments of MEE, NDMC, Maldives Meteorological Services, Local Government Authority and local experts in the area of climate change and water. The major consultation was held on Tuesday 16th June 2015 during the National Stakeholder Consultation Meeting where all major stakeholders provided feedback to the Project Concept. A Project Validation Meeting was held on 13th July 2015 to appraise and provide feedback to the full proposal document (see Annex VII of the GCF proposal).

Needs of Recipient (E.4)

Vulnerability of country and beneficiary groups (E.4.1 para 109-115)

14. Climate change presents a number of profound challenges to the Maldives, due to the impacts of sea level rise, changing rainfall, temperature rises and increase in extreme events. The Maldives 2007 National Adaptation Plan of Action (NAPA) identified the following key trends:

- *Sea level* is predicted to rise under all IPCC scenarios. In the Maldives the observed trend is approximately 3.1 mm/year increase in mean sea level, with a 7mm/year rate for extreme sea level rise. This means that storm surge events are on the increase[7]. For example, for Hulhule a 70cm surge is currently a 100-year

[7] ICCR downscale report

event, but this is predicted to become an annual event by 2050. The safe yield of groundwater for islands is expected to decrease with rising sea levels[8];

- *Rainfall* is expected to decline throughout the Indian Ocean region. In the Maldives, projections indicate a possible increase in extreme events. For example, currently a 180mm daily rainfall event occurs 1 in every 17 years on average; this is expected to occur twice as often by 2050. Dry seasons can expect to be drier;
- *Temperature* is expected to increase between 2.1°C and 3.2°C by 2050 and 2080 respectively in the Indian Ocean region. In Maldives, projections indicate that a 1.5°C rise can be expected by 2100. Sea surface temperature changes are already being observed across seasons with relatively high rates of increase. This will increase the rate of ocean bleaching and the risk of coral die-off during the local ocean spikes that occur during El Nino events[9];
- *Extreme events* – cyclones in the region are expected to increase in intensity. Currently 60 knot winds are a 1 in 16-year event on average but this is predicted to become a 9-year event by 2025. Cyclonic storm surges, if coupled with high tide, are predicted to reach 2.3m and will cause regular flooding on most islands.

15. The main vulnerabilities of water supply to climate change include:

- Rising global temperatures may result in greater heat stress for people and ecosystems, thus, increasing water withdrawal;
- Sea level rise and associated salt water intrusion reduces the size of the fresh groundwater lens;
- Storm events and associated flooding with negative effects on groundwater due to saline water intrusion and sewage pollution from island over-topping;
- Reduced annual rainfall affecting water availability and quality, as well as recharge of groundwater lens;
- Two drought issues are especially risky for Maldives: i) extended dry seasons during which harvested rainwater runs out; and ii) reduced overall recharge during the wet season, affecting the availability of groundwater.

16. Over 53% of the Maldives population lives in the outer islands, approximately 211,000 people and 103,000 women among them. Income levels in the outer islands are twice as lower as a national average. For example, monthly earnings of a household in an outer island is approximately US$600, whereas a monthly national average for a household exceeds US$1,116[10]. The population in these islands typically suffers drinking water shortages in the 90 days of dry season, posing a significant water insecurity. Island rainwater tanks supplied water for only 8 months or less, indicating a major gap between supply and demand in the dry season. In 2004, an estimated 30% of the outer islands' population experienced water shortages, and since 2005 an average of 81 islands have requested "emergency" shipments of water to be delivered from Male' during the annual dry season, as the islands' stored rainwater reserves ran out, with an average of 3,500,000 litres being shipped out annually. Currently, the water emergency distribution is highly vulnerable because of a significant reliance on desalinated water in Male'.

17. Other baseline stresses are excessive groundwater extraction in relation to recharge, particularly on islands with higher population densities has led to salt water intrusion. Due to increasing demand and limited supply, it is projected that per capita groundwater availability for the Maldives will decline by 34% from the 2009 level of 103,000 litres/year, to 77,000 litres/year by 2035[11].

18. Sewage pollution of groundwater resources and rainfall variability is a major problem and challenge for resilience to climate change and has significant impact on health and well-being, again particularly in the islands of

[8] CTL Consult LTD (2013) Formulation of guidelines for Climate Risk Coastal Protection in the Maldives – Final Report, for Ministry of Environment and Energy, Republic of Maldives

[9] The severe 1998 El Nino event raised sea surface temperatures around the Maldives by as much as 5C (World Bank, 2014)

[10] World Bank (2014) Country snapshot. < https://www.worldbank.org/content/dam/Worldbank/document/SAR/maldives-country-snapshot-spring-2014.pdf >

[11] World Bank (2013) Synthesis study of water security in the Republic of Maldives

larger populations[12]. Population growth will mean that sewage discharges will increase by approximately the same rate, and the rate of urbanization (4.2%) will result in higher density communities with knock-on impacts on pollution from waste disposal.

19. The main barrier to investment is finance, with cost recovery levels being low, mainly due to high operating costs and low population solvency, which prevent investments in maintenance and renewal necessary for well-functioning service delivery. The dispersed nature of the population poses a unique challenge to the equitable delivery of basic services, as the small population of most islands result in severe diseconomies of scale. Among the essential services that have not reached all the people of the Maldives are access to safe drinking water and proper sanitation. There are other barriers – mainly management and institutional capacities which are explained in Section D2 of the GCF proposal. Measures to improve these management capacities are addressed across all outputs of the project (see Section B3 of the GCF proposal for details).

20. The islands selected for this project are among the most vulnerable. These following selection criteria were used to select the islands where the principal investment will be located, specifically islands that:
For IWRM:

- consistently request emergency water supply during the dry season (at least during the past five or more years);
- do not have any on-going water projects;
- with larger population and with high population growth rates; and also with high population density (that limit potential for rainwater collection and therefore RO back up production is simply inevitable));

can fit the above criteria and can potentially serve as new sub-regional hubs for dry season water supply (by creating an atoll-based hub of distribution and back-up supplies during shortages);
For RWH systems:

- do not have RO production potential, are medium to small in population (with population decline or no growth and low population density – low density means land availability to increase RWH potential through placement of bigger tanks) and remote that incur high transportation cost during the dry season; and preferably with potential to recover the groundwater (groundwater available and is of some use and can be recovered).

Financial, economic, social and institutional needs (E.4.2 para 116-119)

21. Financial and economic needs: Maldives' macro-economic environment is significantly stressed. The current account deficit reached 27% in 2013. Public debt escalated to 86% of GDP in 2013 and is expected to reach 96% of GDP by 2015. Maldives is deemed to be at high risk of debt distress. Furthermore, coping with small economies of scale is very challenging in providing water and sanitation capital infrastructure in small island nations like Maldives. High operating costs and small and dispersed population across many islands makes commercial viability of the water supply service difficult for populations of less than 1500. Furthermore, without adequate water services, people tend to move to bigger islands, especially Male', where already a half of the country's population resides. These are disrupting the demographic and social fabric on the islands and interrupting the prospects of economic development. Other constraints in investing in water supply services are noted in section B1 of the GCF proposal.

22. More than 80% of the land is less than 1 meter above sea level and more than 75% of critical infrastructure and 45% of dwellings is within 100 meters of the shoreline. Since water security in Maldives is closely bound to rainfall and groundwater quality, the potential for climate change to impact adversely on Maldives makes it a highly vulnerable country. Thus, GoM can ill afford, under the current fiscal situation, to protect its population and provide basic services (water and sanitation) in the face of climate change. Population growth will compound the numbers that are vulnerable.

[12] See for example, Arup (2014) Hinnavaru island water supply- Concept design report, for UNOPS

23. Social needs: Section D.4 of the GCF proposal summarizes the expected impacts on the people of Maldives. In addition, there is low participation of communities in their island's development, leaving communities disenfranchised. Island authorities have a mandate but limited resources to be able to lead their island's development. Services and opportunities are concentrated in the Male' region, with many of the outer islands having limited access to basic service provision and job opportunities. This adds to the service delivery challenge.

24. Institutional needs: Addressing basic service needs and strengthening decentralized models of service delivery, is an important strategy to generate broad-based growth that is responsive of local needs, which can form the basis for further investment in resilience to climate change. The current situation is one where there are challenges in decentralization, challenges in substantiating the objectives enshrined in legislation; limited budgets and institutional fragmentation. Existing water and sewerage systems suffer from "supply-based planning," in which local O&M capacity or ability to pay for the services is poorly taken into account during project planning, and communities are not willing to pay for costly O&M.

III. STRATEGY

Project / Programme Objective against Baseline (C.2 para 13-38)

Baseline: Water security

25. Highly urbanized centres such as Male' are predominantly reliant on desalinated water. Water supply is managed by a partly State-Owned Enterprise. Piped water supply networks exist in Male' where a half of total population of the country resides. However, in outer islands, individual households are largely responsible for harvesting rainwater and extracting groundwater from privately dug wells at their own cost. Management of the limited water resources is complicated by the small catchment areas for rainfall, limited rainwater and groundwater storage capacity, long dry seasons and the susceptibility of groundwater aquifers to pollution from poor sanitation over many years and salinity intrusion through over-extraction mainly. An annual urbanization rate of 4.2% results in high density communities on some islands (population densities of more than 300 per hectare are not uncommon in Maldives) with acute problems in groundwater pollution and water demand. Hence, one-size-fit-all solutions of water production and supply cannot be applied in a diverse context of atolls and islands. Difference in geography (land availability), hydro-climatic characteristics (rainfall amounts and distribution patterns) and socio-economic conditions (population size, density, growing trends and a type of customer base) suggests the need for decentralized and fully customized approaches to water production and distribution to achieve island and atoll level self-sufficiency.

26. The freshwater lens underlying each island has historically been the most important water source for islands. The thickness of the freshwater lens, which typically floats atop the denser sea water, is controlled by island width, rainfall rates and associated infiltration and recharge[13]. Depending on these factors, lens thickness range from less than a few meters to 25-30 meters. Knowledge regarding quantity of groundwater of the Maldives during average annual climatic variations is lacking, but recent modelling results indicate that many of the islands are expected to have a measurable freshwater lens although significant decreases (at least 50%) in thickness can occur during the dry season months. For small islands (less than 300 meters in width) complete depletion of the lens is likely to occur during the dry season or after successive years of low annual rainfall. The freshwater lens is thicker for islands in the South of the country due to higher rainfall levels than the Central and Northern regions[14], with the North being particularly dry. Furthermore, excessive groundwater extraction in relation to recharge has led to salt water intrusion and up-coning of saline water together with the preferential flow paths and reduction of the efficiency of natural recharge processes[15]. Thus, the concern is that during droughts, over-pumping can alter the size of the aquifer and limit recovery to its former size. Observation and anecdotal evidence points to ponding due to soil compaction and reduced infiltration capacity in areas of roads and built up areas, leading to evaporation losses[16].

27. Increases in the salinity of islands' freshwater lenses that immediately followed the 2004 tsunami and pollution of these lenses with sewage washed from overtopped septic tanks was a turning point in ground water use. Saltwater intrusion into fresh water lenses on almost all of the 1,200 islands resulted in vegetation browning and dieback. Since then, every year, government has provided emergency freshwater to many islands. The provision of emergency water used to be managed by the National Disaster Management Centre (NDMC) and was later transferred to MEE. Also, the impact of the tsunami was such that the pressure caused destruction to the septic tanks and toilets resulting in disposal of sewage onto the ground and contamination of water lens. Communities were advised that groundwater was contaminated and no longer fit for use. That message was so effective that the apparent general

[13] Rainwater that is not intercepted by vegetation, captured by roof-top catchment systems, evaporated or transpired by plants, percolates through the thin soil profile and recharges the freshwater lens at the water table.

[14] Bailey, R.T., Khalil, A, Chatikavanij, V., (2014) Estimating transient freshwater lens dynamics for atoll islands of the Maldives. *Journal of Hydrology* 515, pp247-256

[15] Arup (2014) Hinnavaru island water supply- Concept design report, for UNOPS

[16] USAID. 2012. Maldives Water and Sewer Tariffs: Current Framework and Policies - May 2012

community perception now is that it is no longer safe to use local household wells for potable or secondary (bathing and washing) use. Although water quality monitoring is rarely conducted, anecdotal site specific reports of "bad smells" and high incidences of diarrhoeal disease indicate bacterial contamination of the groundwater. Women are particularly affected due to their family roles in cooking, washing, bathing children and house cleaning. Complaints of skin irritations and infections are also common[17]. These issues have reduced the use of historically important groundwater as a potable water source in the islands, though it is still used for non-potable uses such as bathing, washing and flushing. Unless this significant water resource is recovered for freshwater use the long-term resilience of people in the outer islands, and the water sector is out of reach.

28. Due to the seasonality of the replenishment potential of the underground freshwater lenses, rainwater collection is another important source of water in the country. The national average rainwater storage per household is 2,900 litres. In a survey carried out in 2012[18], 141 islands out of the 202 surveyed reported that island rainwater tanks supplied water for only 8 months or less, indicating a major gap between supply and demand in the dry season. This is a particular issue in the northern atolls, characterized by longer dry periods and where almost two thirds of the outer island population are located. Even in the wetter south, maintaining rainwater supply in the dry season is a challenge for relatively large households. Yet, inter-annual variability means that a significant portion of flooding is caused by heavy rainfall events, highlighting a potential opportunity for better capture of water. Existing rainwater-harvesting systems are largely disconnected and sub-optimal in terms of their capacity, yield, and quality and hygiene. Typically, these tanks occupy more space per unit of water (only 2,500 litres) than required. A World Bank study estimated that in the Northern region of the Maldives alone, an additional 14,350 tanks of 7,500 litres volume are needed (World Bank, 2013). In some islands roof area is available for rainwater harvesting; however, land may not be available for storage tanks. Therefore, despite obvious room for further maximizing the rainwater collection, especially from public buildings, availability of land on some of the outer islands is a limiting factor for increasing rainwater collection in islands.

29. Many of the Reverse Osmosis (RO) plants introduced during the post tsunami emergency operation currently stand idle as they had been introduced during emergency recovery without much consideration of adoptability and maintenance capabilities in terms of local engineering skills and capacities for operation and maintenance, operating costs (including fuel cost) of such plants or availability of spare parts at the local and regional markets. If these existing idled assets are to be sustainably redeployed, major rehabilitation, modernization, and suitable management and cost recovery systems (including pricing schemes) are required.

30. Sewerage systems have been installed on an estimated 49 outer islands, around 26% of islands. However, challenges are faced in operation and maintenance, partly because the management and technical and maintenance capacity is weak[19]. Some islands practice on-site sanitation methods such as septic tanks, which may be installed in close proximity to domestic wells due to space constraints. They are known for polluting the groundwater due to leakage. As the frequency of extreme events related to rainfall increases as climate change worsens, this risk will only become higher.

31. In 2004, an estimated 30% of the outer islands' population experienced water shortages, and since 2005 an average of 81 islands have requested emergency shipments of water to be delivered from Male' during the annual dry season. The calls for emergency shipments have intensified as the islands' stored rainwater reserves become depleted. Over the last 10 years, this has resulted on an average of 3,500,000 litres shipped out annually. During 2005-2012, the National Disaster Management Centre (NDMC) spent US$2.4 million (annual average of US$300,000) to provide desalinated water to over 90 islands. The average unit cost of water including production and distribution cost was US$77 per cubic meter (while it cost less than 6US$ to produce 1 cubic meter of water from an RO plant).

[17] Jayaweera, A. (2015) Recommendations and guidelines for water quality surveillance for Laamu Atoll Maldives for WHO Maldives

[18] World Bank (2013) Synthesis study of water security in the Republic of Maldives

[19] For example, the ARUP (2014) report reports that over-pumping has resulted in salinization and sewage contamination of groundwater even with a wastewater treatment plant. The water quality results show that little or no contaminants were being taken out of the waste water at the plant.

This is a recurrent pressure over already strained budgetary resources of the country. Furthermore, the cost of supplying bottled water is high and provides no economic rationale.

32. Currently, the water emergency distribution is centralized, with limitations for timely response. It is also highly vulnerable because of the significant reliance on desalinated water in Male'. The Male' water crisis of 2014 highlights this vulnerability. The main RO plant that supplies the capital Male' and provides most water for emergency supply to the islands was burned down, which paralyzed the water supply and prompted a call for international support.

33. Incrementality of the proposed project lies into its core strategy of maximizing the water production capacity in response to discernable impacts of climate change. Projected impacts are mainly associated with changing rainfall patterns and sea level rise that are likely to result in growing water stress. In the absence of any surface water, rainfall and groundwater are the main natural water resources of the country.

34. Baseline Scenario: At the baseline, the government has supplied all households with the rainwater collection tanks of 2,500 liters of storage capacity. At the same time, the government is heavily investing into the water sector by expanding the network of piped water supply and the sewerage (see section on baseline investment). Adequate sanitation infrastructure is critical for reversing the current pollution rates of the groundwater from the unpiped system of septic tanks. Thus, rainfall collection and a quality groundwater are fundamental ingredients to safe and reliable water supply. With a projected 60% increase in the number of households by 2033, the next 20 years will be critical for the water sector in the Maldives. Due to increasing demand and limited supply, it is projected that per capita groundwater availability for the Maldives will decline by 34%-- from the 2009 level of 103 litres/year to 77 litres/year by 2035[20]. Population growth will mean that sewage discharges will increase by approximately the same rate, and the rate of urbanization (4.2%) will result in higher density communities with knock-on impacts on pollution from waste disposal, particularly given the fragility of the freshwater lenses. Furthermore, higher urbanization will preclude the rainwater to permeate into the underground lenses unless a deliberative protection of catchment areas takes place. The baseline scenario of increasing water stress will be exacerbated by the climate change impacts. This calls for innovative and integrated solutions to water sector resilience.

35. Adaptation Scenario: According to IPCC and RIMES report (2012), sea level rise of 3.1 mm/year will have a profound impact on saltwater intrusion into the groundwater lenses, jeopardizing the main freshwater source for the country. Overall aridity is projected over the Indian Ocean. This will likely translate into prolonged drier seasons. More variable spatial and temporal distribution of rainfall will likely pose significant threats both to the groundwater recharge and rainfall collection (see section on climate change). As water security is closely bound to rainfall and sea level rise in Maldives, the adaptation scenario will demand: (i) the rainfall collection capacity to increase at least threefold (from currently over 2,500 liters to over 6,000 liters): (ii) groundwater replenishment to keep water table levels high in order to buffer away salt water intrusion; and (iii) increased water production capacity through desalinization, as to secure sufficient back up resource during the extended dry periods for household supply and timely distribution. Therefore, the additional investment into the water production system is fully incremental as necessitated by climate change impacts.

Baseline investment

36. The government actively invests in the water sector, covering piped sewerage, water harvesting and RO plants. Ministry of Environment and Energy (MEE) has budgeted US$96.64 million of public expenditure in water and sanitation sector during 2015-2017. Out of this, US$77.69 million is budgeted for sanitation and US$18.96 million in water production and distribution. This investment covers the islands in the same atolls where the GCF grant investment is proposed and will serve as baseline finance, in parallel to the proposed GCF project (see Annex IV of the GCF proposal). MEE for the same period of time has successfully mobilized other sources of finance, a

[20] World Bank (2013) Synthesis study of water security in the Republic of Maldives

combination of loans and grants for the sector, the larger portion of which is being invested in the piped sewerage system. Expenditure of these funds will extend over the period of next 5-7 years and will provide an important funding at the baseline for the GCF incremental cost finance for climate change risks in the water sector. Despite the commitment and impressive capital investments in the sector, lingering fiscal deficits have constrained assistance to be extended to a considerable number of outer atoll island communities. Without any support, these communities, especially in the drier North, are incredibly vulnerable, and this will only worsen with climate change. Additionally, there are two highly relevant internationally funded projects that the GCF financed initiative will build on: (i) Adaptation Fund financed and project: "Increasing climate resilience through an Integrated Water Resource Management Programme" (US$8,285,000); and (ii) USAID financed: integrated water management project (US$ 7.3 million), designed to mobilize the communities it serves and work with provincial utilities to design, build, and operate seawater desalinization facilities to deliver clean drinking water to one island (further details in section C.3. of the GCF proposal).

Climate change

37. Small islands states, such as Maldives, have characteristics which make them especially vulnerable to the effects of climate change extreme events, rainfall distribution anomalies and sea level rise. An ensemble of 18 Global Calculation Models (GCMs) project the following with regards to climate change in the Maldives[21]. The observed trend for sea level rise is 3.3mm per year for Male' (in the centre) and 3.1mm per year for Gan (in the South). Maximum sea surface heights increase within the range of 8.2 to 9.5 cm across the various atolls for 2080s. Mean annual temperature from 2021 to 2050 increases by 1.5°C to 1.85° C from the observed mean (RIMES report, 2012). The surface air temperate change for the whole of Maldives for 2080s ranges between 1.6°C to 3.7°C. Sea surface temperature change for the Maldives for the same time period ranges between 1.27°C to 3.4°C (RIMES report, 2012). The intensity of tropical cyclones is expected to increase by 10% to 20% by 2050.

38. Average annual rainfall in Maldives is 2124 mm per annum, ranging from 1799 mm in the North to 2321 mm. in the South. Future projections from the set of GCMs examined show a range of 1250 to 3185mm. Available historic rainfall records show annual and seasonal rainfalls are decreasing in the Maldives (MEE, 2011). Rainfall in Maldives varies from north to south with the amount of rainfall increasing towards the south. This difference in rainfall patterns is primarily due to the northeast monsoon period and April being much drier in the north than in the south. Greater extremes of dry periods and heavy rainfall are expected increasing the risks of droughts and floods, especially during El Nino events. A 180 mm/day rainfall event is currently a 100-year event but is expected to occur twice as often by 2050[22].

39. Groundwater is highly vulnerable to the impacts of climate change. Rising global temperatures may result in greater heat stress for people and ecosystems, thus, increasing water withdrawal[23]. In addition, sea-level rise, increased wave energy at the coast and increased frequency of tidal surges will increase island-overtopping events and coastal erosion which will increase saline intrusion into freshwater lenses. Two drought issues are especially risky for Maldives: i) extended dry seasons during which harvested rainwater runs out; and ii) reduced overall recharge during the wet season, affecting the availability of groundwater. Thus, the patterns of rainfall are as important as average annual changes.

40. Observed experiences bear these risks out. Maldives has been experiencing high frequency, low impact hydro-meteorological disasters causing storm surges and often coastal flooding. Since 2007, more than 90 inhabited islands have been flooded at least once and 37 islands have been flooded regularly or at least once a year. More than 97% of inhabited islands reported beach erosion in 2004, of which 64% reported severe beach erosion. The 2004 Tsunami experience showed how extreme weather events such as cyclones and storm surge flooding can cause

[21] RIMES Report 4 Climate Scenarios and Their Interpretations for Maldives, 2012

[22] MEE, (2001), First National Communication

[23] The current benchmark applied by GoM (as per MoH, 1996) is to provide access to 10 litres per person per day of safe water for drinking and cooking and in islands where groundwater is unfit for any potable use to provide 40 litres per day. Temperature increases expected with climate change may require this base level to increase to 12 litres per person per day (WB Study).

saline intrusion and overflow of septic tanks into freshwater lenses. Storm surge due to extreme weather events would have similar consequences. Climate-sensitive illnesses such as diarrhea and vector borne diseases have shown increasing trends in recent years and there are marked seasonal patterns with peaks in diarrheal diseases in the wet season, which is consistent with polluted ground water especially following heavy rainfall events. In fact, national average rainfall, lagged by one month, is a significant predictor of the illness in every case[24].

Adaptation Solution

41. A practical adaptation solution to the above lies in developing a water supply system that integrates the three main sources of water (rainwater, groundwater and desalinated water) into a least cost delivery system and which is able to maintain service levels in the context of climate change, particularly greater rainfall variability and extended dry seasons. Early warning information, based on forecasted meteorological information, will also be required to feed into and guide system management. Standard Operating Procedures (SOPs) for water management will need to be developed and put into use. The system also needs to be based on least cost ways of delivering basic services through effective management of water resources, the use of renewable energy and locally appropriate energy efficient technologies. The system also needs the support and ownership from communities and their willingness to pay for the service necessary for financial and overall sustainability of the system. Capacity development of the State Utilities to manage service delivery for many of the water stressed atoll islands, as well as the decentralized authorities and central government level is required to provide the appropriate enabling planning and institutional framework to ensure sustainable production and distribution of water resources. In order to achieve the above solution, there are a number of barriers (primarily institutional and financial) that need to be overcome.

Institutional barriers

42. Despite the current legislative environment including various national policies, clear directions are necessary for local agencies focusing on water resources, communities, as well as development partners supporting Maldives on the need to promote and support the diffusion of integrated water production and distribution systems in the most vulnerable outer islands. An overarching Water and Sewerage Act and water policy is currently being formulated. However, existing sub-laws and regulations related to water and sanitation is insufficiently implemented to effectively protect water sources or regulate their use. Furthermore, there is a need to further integrate the climate change implication to water sector planning.

43. Decentralization and community involvement in water management remains in its infancy. The Decentralization Act that covers water resources provides a mandate to local councils but available funding is insufficient to implement this mandate. Current water supply systems were mainly developed through “supply-based planning”, in which local O&M capacity or ability to pay for the services is not sufficiently taken into account during project planning, causing operational issues during implementation. There is a low rate of cost recovery from households and thus there is a need for subsidization from the central government to sustain these services. Steps are taken to build awareness, sensitization and dialogue to ensure island communities are willing to pay for O&M. Further mechanisms to involve local island councils and communities in project formulation or discussions on local water and sanitation requirements are needed, to heighten ownership of completed investments. The low rate of cost recovery from households leads to inadequate local funds to pay for basic operations and maintenance. In fact, over the past nine years the outer islands have become increasingly dependent on Male’ based agencies to provide both public investments and basic water and sanitation management.

44. There are various high-level government institutions involved in sector oversight, with multiple levels below them at central and local level. The wide array of agencies involved in the sector has led to fragmentation in key areas such as water and sanitation services, water quality monitoring, water resource protection and regulation of use and capital project assessment, design, and implementation. Different government agencies have overlapping

[24] Hales, S. (2015) Vulnerability and adaptation to health impacts of climate change in Maldives, For Government of Maldives

responsibilities. For instance, Ministry for Environment and Energy (MEE) oversees water and sanitation project design and construction as well as carrying the policy mandate, and is in charge of emergency water supplies, while the utilities are the service providers. The Environmental Protection Agency (EPA) (which is institutionally housed within MEE) is the regulatory body and is responsible for water quality monitoring and approving water and sanitation tariff structures. The Ministry of Health (MoH) also has responsibility for potable water quality monitoring, though only peripherally involved in water resources management. There are, in effect, two separate regulators of water quality: EPA for public water, groundwater, and discharges of sewerage, and MoH for bottled water, acting under the Public Health Act. The public health basis for water and sanitation provision is not a large part of the current water supply and sanitation (WSS) implementation plan, headed by the Water and Sanitation Department (WSD) under the Ministry of Environmental and Energy (MEE). WSD's core competency lies in infrastructure planning and development.

45. STELCO, a state-owned utility, has a primary focus on electricity generation and distribution. Water and sanitation services for STELCO has been a relatively new obligation. Therefore, staff development and funding remains largely inadequate for both STELCO and FENAKA which is also a government owned utility company. Utilities, while operating these systems are challenged by shortages in trained personnel in the islands. As a result, interruptions of services at the local level are frequent with little staff expertise to remedy the problems. The water and sewerage systems now under the purview of utilities serving outer islands are not profit making entities, often with unclear rates of equipment use or failure, and with few planned maintenance schedules and, importantly, with insufficient staff resources. Owing to their mandate to provide water and sewerage services to the outer islands, FENAKA and STELCO are positioned in the national water and sewerage market with almost no potential for profit, compared with MWSC which serves the high population centres such as greater Male' and Kulhudhuffushi

Financial barriers

46. GoM faces many constraints in investing in water supply service: (i) high and prolonged budget deficit and public debts lead to weak fiscal position; (ii) public service delivery is costly in the complex geographical context of broadly dispersed small islands where economies of scale is lacking; (iii) limited access to clean piped water in all islands is partly a result of current high tariff level that cannot attract sufficient investment as well as that of a small customer base in most islands; and (iv) electricity (which mostly requires imported expensive diesel fuel) is the major part of the operating cost of the water supply system, especially in the desalination process and pumping.

47. Appropriate levels of infrastructure and associated services that are economically feasible for islands of different population size and density is a considerable challenge to the financial viability of capital investment and a service that is provided based on a principle of cost-recovery. According to estimations (MWSC, 2011) the population level per island at which piped and household connected water service is relatively economically feasible is set at minimum 2,000 residents and above. This amounts to only 15% of the islands in the entire country, largely concentrated in the capital Male' and Male' region. These islands are already well served by the MWSC- the utility providing the service. Such high level of water supply with desalinated water is not economically feasible in the majority of outer islands of the Maldives due to lack of economies of scale. Although utilities are expected to recover the cost of their service they are only able to do so through cross subsidization across the islands. Utilities often cross subsidize their services to small islands that are commercially unviable from their service to bigger islands with larger population where cost-recovery rates are relatively high. However, even if the utilities cannot fully recover the cost they are still obligated to provide the service as equitable access to freshwater is a constitutional right in the country.

48. Utilities serving the outer islands face significant constraints in their financial prospects. Their financial performance is adversely affected by the low rates of cost recovery for the services they provide. This is linked to the current gaps in policy or guidelines for water and sanitation tariffs, although the Water Act that is forthcoming includes that prices should be set for the provision of water. EPA as a regulatory body is responsible for approving tariff proposals submitted by service providers (utilities and / or island councils) and approval is done on a case by case basis. However, EPA needs a systematic criterion through which to evaluate proposals, and there is limited access to information or predictability on how the prices will be set. EPA as the environmental regulator lacks

adequate expertise for the financial intricacies of tariff development, causing delays in approvals which in turn affects service delivery. At the same time, most utilities do not have adequate billing systems in place for water and sewerage systems, which is an additional challenge for utilities such as FENAKA. The maintenance programs of most utilities are often incomplete, resulting in equipment failure across the systems. Making utilities a viable business will require improved tariff policies, pricing and cost-recovery schemes in order to cover full operating costs for providing WSS in dispersed islands the majority of which have small population numbers.

49. Until now, the provision of water supply in the Maldives has been heavily subsidized by government. This is especially so on remote islands, but is also taking place in Male itself where water tariffs have not been increased since 1995 and where it is estimated that Government subsidizes 5 to 10% of the Male Water and Sewerage Company (MWSC). A recent USAID study concluded that: "It may be that a water tariff system required to achieve full cost recovery is simply not viable or sustainable and therefore that a central government tariff-subsidy mechanism is required."[25] Against this policy background is the recognition that climate change already has had significant impacts on water supply and in particular on the frequency and duration of water shortages. These changes are expected to intensify in coming decades. Thus far, these shortages have been addressed with the transport of potable water from Male to islands experiencing water shortages. The Government of the Maldives is keenly aware that the existing tariff subsidization framework (or lack thereof) exerts a considerable fiscal burden on Government's budget. Government is also aware that the subsidization of water transport as a means of addressing water shortages proves to be increasingly costly and is fiscally unsustainable. The project aims to address both of the above issues by (1) reducing the costs of addressing water shortages on remote islands and (2) in collaboration with Government, developing a policy framework to facilitate the cost-recovery of water supply provision in the Maldives. As pointed out in the above USAID study, at least in the short-term and in the absence of a clear water tariff policy framework, water supply provision on remote islands of the Maldives cannot be provided on a commercial basis and aimed at full-cost recovery. Hence, without a significant grant component, water supply systems on remote islands are not financially viable. These systems must however be put in place as a means to reduce the increasing fiscal cost of the current approach for addressing water shortages. However, an important objective of the project is that the development of a water policy and pricing framework will facilitate the recovery of operations and maintenance costs and ensure the financial and operational sustainability of water supply systems.

50. The **main goal** of the proposed project is to increase climate-resilient water security in Maldives. In particular, the proposed project will benefit 105,000 people from the year-round access to reliable and safe water supply despite climate/weather shocks and stresses.

Impact Potential (E.1)

Mitigation / adaptation impact potential (E.1.1 para 91-94)

51. The project will directly contribute to a Fund level impact of increased resilience of water security. Approximately 105,000 people, out of which over 50% women will have uninterrupted, a year-round access to safe and secure water in the face of climate change. A 90 day of reserved clean water will be secured and the exposure to the health risks from untreated water will be reduced. This will particularly benefit women, as a recurrent water stress adds to their daily household chores. Women are responsible for cleaning, cooking and washing in their homes and are affected not only by severe shortages but also poor quality of water that is available to them from the polluted groundwater. The GCF resources will be used to upscale the technologies across atolls and islands that have been tested by the Government. An estimated 32,000 people, including over 15,000 women across 49 islands in the 13 Atolls will benefit from direct investments in water production, distribution and management. These qualify as direct **beneficiaries** of **high intensity**. In addition, 73,000 people, including 46,000 women, across all northern atolls will directly benefit from effective dry season water supply; these are **direct beneficiaries** of **medium intensity**. A decentralized system of water production and distribution hubs for northern atolls will be more effective and timely,

[25] USAID. 2012. Maldives Water and Sewer Tariffs: Current Framework and Policies - May 2012

than the current system of centralized emergency water supply and distribution. Number of beneficiaries has been calculated, based on the latest census statistics[26]. The table below explains the GCF investment direct beneficiaries more accurately.

Table 1: GCF direct beneficiaries[27]

Categories of direct beneficiaries		**Description of water production and distribution methodology**	**Total population**	**Female**	**Number of islands**
A		4 IWRM islands (all three sources of water)	5,375	2,362	4
B		45 RWH islands (one or two sources of water)	26,625	13,133	45
C	*C=A+B*	*TOTAL for 49 GCF islands*	***32,000***	*15,495*	*49*
D		Hub and spoke model of dry season water supply across all islands in North (7 atolls, 91 islands) that will benefit from the new water production hubs under the A category; but do not include the C beneficiaries of the North to avoid double counting.	**73,000**	46,656	91
E		GCF supported islands (Central and Southern atolls) NOT in the North (counted under C)	14,939	6,926	25
F	*F=C+D*	*TOTAL for ALL population benefitting from GCF*	***105,000***	*53,582*	*116*

52. Furthermore, 190,000 **indirect beneficiaries**, out of which over 50% women, represent the total population of the outer islands to whom FENAKA and STELCO provide water and sanitation services. As a result of this project, these utilities will have improved service provision capacities and hence will manage their service delivery for greater satisfaction of the target island populations. Ground water quality will be improved to an acceptable standard (in accordance with EPA standards) which will add to system resilience against expected climate change impacts, especially during dry years, when the banked water can be accessed at a lower cost than desalinized water. Water security may be measured as the increase in months where households have rainwater available to them for consumption. Islands in targeted atolls will no longer request dry season supplementary water and will no longer experience water shortages during the prolonged dry seasons that will likely result from climate change impacts.

53. The project will enhance overall adaptive capacity of the water sector by improving technical and management capacity of the utilities servicing the vulnerable outer islands, constituting 61% of the total population of the country. More specifically, a detailed standard operating procedures (SOPs) for all integrated water production technologies will enhance service provision, both reliability and safety of water supply. Overall regulatory framework, including the protection, recharge and monitoring protocols for the groundwater, the primary water resource for the country, will considerably enhance the quality and quantity of the resource for the benefit of vulnerable populations of the outer islands. As a result, environmental health improvements are expected. Baseline data will be collected at the start of the implementation phase on current burden of illnesses such as diarrhea, gastroenteritis, salmonella and other water and vector borne diseases, specifically for the target islands. Water quality monitoring, together with processes to involve island communities will create a local level leadership for water quality improvements and safety. Change in these indices will be measured towards the end of the project, and results will be disseminated to island communities to reinforce their support for the integrated water supply service.

54. Section E.3.1 of the GCF proposal has the complete list of performance indicators that will be monitored. Section E.2.2 of the GCF proposal outlines the benefits expected in terms of adaptive capacity (technology provision, water resource management, financial sustainability, participatory development processes and regulatory management) and resilience (promoting agency, empowerment and self-organization; maximizing diversity; promoting flexibility in water solutions and upgrading skills and knowledge.

[26] According to population projections there will be much more beneficiaries. For example, only from the RWR investment (category B) it is about 39,068 people which will benefit from the system in 2040

[27] Number of beneficiaries has been calculated based on the latest population census data of 2014.

Table 2: Key impact potential indicator (E.1.2 para 95)

GCF core indicators	*Expected tonnes of carbon dioxide equivalent (t CO_2 eq) to be reduced or avoided (Mitigation only)*	*Annual*	
		Lifetime	
	Expected total number of direct and indirect beneficiaries (reduced vulnerability or increased resilience); number of beneficiaries relative to total population (adaptation only)	*Total*	105,000 people
		Percentage (%)	26% of Maldives population
Other relevant indicators	1. Year-round access to safe, affordable and secure water supplies at the island level; 2. Groundwater quality improvements against Environmental Protection Agency (EPA) standard; 3. % increase in groundwater recharge rate; 4. % increase in groundwater use as freshwater; 5. # of islands receiving dry season water 3 days ahead of need from decentralized, atoll-based water production and distribution hubs; 6. % of reduction in dry season water supply cost; 7. Levels of customer satisfaction with service delivery improved to a minimum of 70% of households.		

55. The main methodology for indicators presented above is a calculation of the number of direct beneficiaries both of high and medium intensity. Approximately 100 islands have repeatedly requested for dry season emergency water supply at least once during past five years (e.g. in 2015 - 77 islands). This is indicative of persistent water shortages that will likely become more acute with effects of climate change and hence fall under the government priority to address water supply needs. Government's objective is to eliminate a need for dry season emergency water supply altogether and make most islands and atolls water self-sufficient. The principal strategy is to achieve all year round safe and reliable water supply by optimizing the production and supply of all sources of water in an integrated and cost-efficient system. The government services a number of vulnerable outer islands through ongoing and committed investments with total value of US$96 million for 2015-2017 period. The GCF resources will complement the government investment and cover the total of 32,000 direct beneficiaries of high intensity (where actual water production investments take place). Additionally, as a result of this investment, 4 target islands with full IWRM methodology will have the sufficient water production potential to serve as regional hubs and cover 7 Northern Atolls during the dry season. 73,000 direct beneficiaries of medium intensity across 91 islands of all northern Atolls will benefit from the decentralized and timely dry season water distribution. Therefore, number of direct beneficiaries for year-round safe and reliable water supply is the most appropriate impact indicator for this investment. Additionally, there will also be 190,000 indirect beneficiaries that will benefit from the service improvements provided by the target water utilities (FENAKA and STELCO) that are jointly serving most outer islands. There are also a sub-set of indicators (listed above) that will be used to track the impact (see log frame section).

Paradigm Shift Potential (E.2)

Potential for scaling up and replication (E.2.1 para 96-100)

56. The solution as explained in Section C.3 of the GCF proposal is an integrated water supply deployed through an affordable technology to achieve island level self-sufficiency in water resources. The long-term self-sufficiency is achieved by combining three sources to secure sufficient redundancy of water all year round and in the face of climate change. The project is to introduce the integrated water production and distribution technologies, operation and service standards, and water management capacities and policies. Under output 1, an innovative integrated water production and distribution system will be introduced through accessible and affordable technologies, whereby three sources of water will be combined to deliver a year round safe and reliable water to the vulnerable outer island communities; under output 2: a decentralized, timely and cost-effective dry season water distribution, at the sub-regional and atoll level will be operationalized; and under output 3 a groundwater protection, recharge and monitoring protocols will secure critical water reserves for resilient water security.

57. The theory of change lies in the barrier removal strategy described below whereby the conditions are being created that lead to sustained impacts for replication and scale up with a potential for about three times the initial impact. Number of key barriers (financial and institutional) that prevent a sustainable water system from being implemented will be overcome. By addressing these barriers necessary enabling conditions will be created. In addition, a case will be made, with quantified performance metrics, to Central Government and the decentralized authorities for replication in other islands and Atolls in the Maldives, considering the legislative mandate to provide clean water in the 2008 Constitution of the Maldives. Thus, a paradigm shift could be realized.

58. Recently implemented demonstration projects including those financed by the Adaptation Fund (through UNDP) and USAID provide a blueprint for the integrated system at the island level, notwithstanding that every island has a unique set of conditions that will need to factor into the system design. There are three main barriers to designing and implementing an integrated water supply system, including i) cost recovery for operation and maintenance into the water supply systems ii) management capacity both at the Utility level and at the regulatory levels; and ii) institutional mandates, coordination and policy direction.

59. Each of these three main barriers will be addressed as follows:

i) Cost recovery:

- A fair and affordable **tariff structure** should be established to improve service standards and investment in the system over time. The current increasing block tariff system in place in Male' provides a strong example of a workable tariff structure for the islands. This type of structure includes both a lifeline tier for poor households and a conservation incentive for large water users. Tariff setting criteria and guidelines developed by the project will enable transparent and predictable tariff policy. This will in turn enable setting up the progressive, block tariffs to provide cost-recovery streams for service providers;
- The island's residents' **willingness to pay** for water services depends on seeing and experiencing obvious improvements in water quality and accessibility on the island. Participatory planning processes with communities to shape the system design will be undertaken as a key work stream in order to get their weight behind the principle of cost recovery. As mentioned previously, the financial viability of the system will largely rest on the ability to recover at least some of the costs. This will be achieved in two ways: (i) by reducing water production costs. This will be possible by increasing rainwater collection capacities and a ratio of rainwater into a water mix of a supply system; and by energy switch from an imported and expensive diesel to a grid-tied solar; and (ii) by improving quality of water supply service. This will be addressed through quality control, SOPs and management systems (see below). As such, considerable improvements in service quality and a reduction in production costs, will enable the possibilities for tariff restructuring, towards which the project provides technical criteria and detailed guidelines. The project will provide support to the Government of the Maldives in the development of a tariff setting policy appropriate to the specific circumstances of the Maldives. The Government fully recognizes that the lack of such policy is a key impediment to addressing water supply challenges in the Maldives. It is thus projected that the development and adoption of such policy will then facilitate the financing of similar projects on other islands of the Maldives. To the extent that other SIDS experience similar socio-economic and geographical conditions as the Maldives, it is expected that such policy will be of interest to other SIDS.

ii) Management capacity:

- Developing **SOPs** and guidelines for the operation of an integrated system which includes rainwater harvesting, ground water and desalinated water will enable replication of the integrated system to other islands;
- Capacities and capabilities of FENAKA will be strengthened through **trainings and management system investment** to a good standard of service delivery;
- **Technical certification course** established at the Maldivian Polytechnic Institute for continuing skill development of water engineers and water management practitioners.

iii) Institutional capacity:

- Central government institutions' **ownership through skills development** will be developed through trainings and investments in management systems;
- Development of **regulation** in MEE to drive investments into cost effective resilient water supply and sanitation investments through, development of quality standards for various aspects of infrastructure design, installation and maintenance and the development of public-private partnership contract modalities for emergency water distribution;
- **Management capability** through development of Information on performance metrics (e.g. impacts on health and productivity from investments in water and sanitation systems; cost effectiveness, and resilience of the system against a dynamic climatic baseline), which will serve to strengthen the business case for replication;
- Enhancing **institutional coordination**, for example, working with Ministry of Health staff at the island level as well as making use of their capability on water quality testing could be a driver for effective institutional coordination. Better coordination will provide the conditions for improved understanding of total water sector costs in implementing integrated water and sanitation systems, which can then be compared to performance measures, as well as highlighting where institutional oversight and management efficiencies can be made;
- Influencing of the wider policy **enabling environment** regarding tariffs, groundwater management and associated land use and zoning safeguards, rationalizing policy mandates across numerous institutions responsible for water management, safety, production and distribution. Enhanced institutional coordination at different institutional levels should be able to demonstrate alternative and efficient ways of working driven by the needs and system design at the island level. The project will therefore help to develop policies, the enabling environment in terms of tariff setting and incentives for water service provision and reduce fragmentation of roles. The improved enabling environment will eventually serve to attract private sector provision of services.

Replication potential

60. There is good replication value both within Maldives and for other small island developing states with similar environmental conditions. This project will provide safe and secure water for 105,000 people, which is 26% of the Maldives population. Taking away Male' and its population of approximately 150,000which is already served by a piped water supply system, there is a replication value of more than three times this proposed investment. Over 52% of Maldivian population live in outer islands where the proposed model will successfully apply. Therefore, the replication potential is significant. Furthermore, notwithstanding, that every island has a unique set of conditions that will need to factor into the system design, a multifaceted approach offered by the project that is adjusted to the local Island and atoll specific circumstances may well serve as a model for other small island states in Pacific and elsewhere.

Potential to scale up the solution

61. The investment will demonstrate how an integrated water and sewage management system can build resilience to sea swells, storms, floods and changing rainfall patterns. Through the integrated system whereby all sources of water are managed more effectively and brought into the unified island level water budget will inevitably create sufficient redundancy in the resources thus, making the target islands fully self-sufficient. Complemented by increased water production capacity as well as decentralized and hence timely and cost effective water distribution mechanisms during the extended dry periods, atoll level water self-sufficiency will be created. Early warning information based on forecasted meteorological information will feed into the SOP for system management. It will also show how barriers around cost recovery, management and institutional capacities can be addressed successfully, building on the UNDP supported Adaptation Fund financed project and USAID project experience. This investment will demonstrate the effectiveness of additional inputs that are required to adapt current systems into climate resilient systems through performance indicators set out in Section D.6.5 of the GCF proposal. A public

awareness and communications campaign will disseminate messages and results to other islands with similar challenges. International forums will be actively used to present.

Contribution to the creation of an enabling environment (E.2.2 para 101)

62. The proposed project takes a multi-faceted approach to creating enabling conditions for continuous investment into the climate resilient water supply. The following are the key enabling conditions:

(i) affordable and scalable water production and distribution **technology provision** to secure safe and secure water for 32,000 people in 49 islands (direct and high intensity beneficiaries);
(ii) improved **water resource management** that enables aquifer extraction rates to match sustainable aquifer yields, recharge of natural water storage facilities, catchment protection, and forward looking management of water resources to reflect climate change impacts on rainfall, by substantively contributing to the EPA guidelines to groundwater management, especially parts on monitoring protocols and replenishment methods as well as by designing detailed SOPs for all sources of water – a direct contribution to the subsidiary legislation of an upcoming Water Act;
(iii) **financial sustainability** by reducing the cost of production by (i) promoting the use of the least expensive water source first (rainwater collection), (ii) introducing energy efficient RO technology as well as renewable energy for operation of RO and pumps; and (iii) through structuring tariffs with full consultation with communities and decentralized authorities so that a reasonable level of cost recovery is possible and thereby securing O&M and a satisfactory level of service delivery;
(iv) optimized **regulatory management** in the water sector that promotes decentralized approaches to island and atoll level solutions for self-sufficiency both for water production and dry season distribution. Enabling decentralized approaches through **participation** of households and decentralized authorities in decision-making around system design including maintenance requirements and tariff structure, can promote inclusive development and representative governance.

63. Additionally, the key ways through which this investment will promote resilience[28] of the water sector is as follows:

1. Promoting **empowerment and self-organisation** at the island level so that the integrated system established reflects local priorities and enables local solutions for self-sufficiency;
2. Maximizing **diversity** in the water budget at the island level;
3. Use of meteorological forecast information to promote **flexible and adaptable** management of IWRM strategies;
4. Upgrading of **skills and knowledge** and promoting performance-based management at the institutional level for improved learning about what works, which will also enable replication to other islands.

The above approach and resilience principles will create a comprehensive enabling environment for climate resilient water security in Maldives.

Contribution to regulatory framework and policies (E.2.3 para 102)

64. Section E.2 of the GCF proposal explains how the investment will help to develop management, institutional and regulatory capacities to provide water supply service delivery in a cost effective and environmentally sustainable way. The key outputs will be: i) Development of SOPs and guidelines; ii) updated management information systems at the public utilities (e.g. FENAKA), the decentralized authorities and central government; iii) a tariff setting criteria and detailed guidelines formulated so as to secure transparency and predictability in tariff setting policies, including the wider tariff and subsidy schemes to achieve better economic efficiency; detailed regulatory mechanisms for

[28] Resilience is a concept taken from ecological and social system theory, which says that 'the capacity of a system to absorb disturbance and re-organize while undergoing change so as to still retain essentially the same function, structure, identity and feedback'.

willingness to pay surveys with direct engagement of communities and local authorities to facilitate cost recovery and financial sustainability of water infrastructure at an island level; iv) groundwater protection regulations, including the catchment area protection through land zoning regulations v) regulations to allow for long term, whole sale service agreements for effective water distribution operations during the dry season; and vi) institutional role definition and coordination mechanisms between the key Ministries, departments, agencies, and local authorities responsible for various aspects of water policy formulation or implementation.

Potential for knowledge and learning (E.2.4 para 103)

65. Implementation of concrete adaptation actions on the ground will constitute the primary learning experience, which will feed into all awareness, training and knowledge management actions facilitated and conducted by the project. More specifically the project will design and deliver training programmes in water management, planning and budgeting, expenditure management and performance monitoring for relevant atoll and island councils and the ministries (MEE, MoH). Additionally, certified courses for the utilities and sector specialists in the areas of water engineering, capital construction, operation, maintenance, financial management and planning will be introduced at the Maldivian Polytechnic training institute. This will enable an iterative learning process that will support the sector by developing a cadre of professionals who can support the sector. Additionally, awareness raising and advocacy works will be an integral part of all island-level project activities.

Sustainable Development Potential (E.3)

Environmental, social and economic co-benefits, including gender-sensitive development impact (E.3.1 para 104-108)

The investment is expected to deliver the following sustainable development benefits:

66. The main quantified economic benefit of the proposed project is avoided water production and transportation costs, while securing all year-round safe water supply to the most vulnerable segments of population in Maldives. A 90 day of clean water supply will be secured for target population and exposure to untreated water for drinking and cooking purposes will be avoided. Dry period is experienced during North East monsoon for approximately 90 days. It is however important to note that historically, water shortages experienced by the islands included in the project have been for a period shorter than 90 days since at the onset of the dry period, all existing water storage capacity is filled and will provide water supply into that 90-days period. When water shortages are experienced, they are experienced in the second-half of the dry season for various number of days, varying across islands and across years. The design capacity of the water supply systems in the project is to provide water supply for a period of 90 days, beyond the average duration of water shortages. Hence, the project provides a significant buffer for projected climate impact.

67. The project has multiple social and environment benefits listed below:

1. Reduced level of water insecurity which in turn will raise environmental and social wellbeing and economic productivity;
2. Lowered burden of ill health from the use of contaminated water (avoided damage estimate/dose response function depends on the level of pathogens found in ground water which depends on population density of the island);
3. Reduced greenhouse gas emissions through reduction of production and transportation for water distribution during the dry season;
4. Reduced flood damages through improved rainfall capture and diversion capacity, including improved infiltration of flood water;
5. Increased capacity through education and training on water resource management;
6. Lowered overall economic and social costs of water provision.

68. The magnitude of co-benefits will be scoped out in detail at the start of the implementation phase for the 49 islands in the 13 Atolls.

69. Additionally, this scalable investment would effectively develop the market for water and sanitation service delivery with knock-on impacts on the demand for technical and technology provision services and the employment multiplier that this 'green industry' could have. Anecdotal evidence supports assumptions that addressing water shortages will be source of job and income generation. First, it is often noted that the likelihood of water shortages decreases the potential for commercial investment, particularly in the tourism sector. Second, while the proposal did not aim to quantify the health benefits of providing clean water supply to the selected islands (as existing records do not allow a reliable quantification of these benefits), addressing these health costs will undoubtedly be source of income generation. The other main co-benefit would be in terms of keeping populations stable in the outer islands, thereby creating alternative growth poles in the larger islands which would take pressure off Male' and spread the benefits of growth more evenly, which will help to improve adaptive capacity for the Maldives population in the longer term. These benefits are likely to manifest in the longer-term and will not be formally part of the results framework, though household surveys conducted for this investment will track trends.

70. A gender analysis carried out in 2010 on three islands reports three findings with relevance to this investment. Data reveals that 73% of women control the household budget, and over 95 % of the respondents reported that women have a say on the expenditure of the household. Responsibilities for fetching water from public taps and wells is more or less evenly split between men and women, but with slightly more responsibility falling on women. This has two implications: First, piped water system will profoundly improve women's and men's lives by removing the drudgery of collecting water from wells and taps and freeing time for education, children and other economic, social and cultural activities. This supports the investment proposal for a piped water supply as part of the IWRM solution. Second, women, who are largely responsible for bringing up children and would experience firsthand the impacts of ill health from polluted ground water supplies could be important agents for change to support a safe and affordable service delivery system and associated tariffs. The household surveys conducted for this investment will track the effects of the IWRM system on health and productivity. As such, the project directly contributes to SDG agenda in Maldives, more concretely will help achieve Goal 6 fully by ensuring availability and sustainable management of water and sanitation for all. The project will considerably contribute towards climate change goal 13 as well as the goal 5 on gender equality.

IV. RESULTS AND PARTNERSHIPS

i. *Expected Results:*

(C.3 para 39-69)

71. The **project objective** is to deliver safe and secure freshwater to 105,000 people in the islands of Maldives in the face of climate change.

72. The GCF project will help achieve three outputs:

a. Scaling up integrated water supply system to provide safe water to vulnerable households (at least 32,000 people, including15,000 women);
b. Decentralized and cost-effective dry season water supply system introduced benefiting 73,000 people across 7 Northern Atolls;
c. Groundwater quality improved to secure freshwater reserves for long term resilience on 49 islands.

73. The project will provide sufficient water to supply the potable water needs of island residents year-round for a 35-year design period to 2050. Project finance will be used to establish an integrated water resources management system that integrates the three main sources of water (rainwater, groundwater and desalinated water) into a least cost delivery system and which is able to maintain service levels against a context of rainfall variability and sea level rise and also includes measures for groundwater quality recovery to secure freshwater reserves in the long term. Ultimately, the project will achieve an uninterrupted water supply on the islands that currently experience a 90-day chronic water shortage during dry season and depend on transported water from Male', which is an extensive, overlong and costly operation. As a result of the project, 49 priority islands will have increased rainwater collection capacities, out of which, 4 bigger islands will additionally have water production systems of water desalination (Reverse Osmosis – RO water production plants), that will secure sufficient water production capacity enabling a decentralized and timely water distribution across all northern outer atolls during the extended dry periods, when shortages may occur. Early warning information based on forecasted meteorological information will feed into the Standard Operating Procedures (SOPs) for system management, thereby protecting lives and livelihoods from environmental risks associated with climate change. This will also feed into strengthening the MMS services on reaching out to the communities actionable early warning information, and preparing the communities to receive and act on such information. The system will achieve cost effectiveness in service provision through effective management of water resources and the use of renewable energy and locally appropriate technologies. Alongside the system design will be a capacity development work stream designed to obtain the support and ownership from communities, which is necessary for financial sustainability of the system, as well as the capacity development of the State Utilities (such as FENAKA and STELCO) to manage service delivery, and of the decentralized authorities and central government to provide an enabling environment for sustainability and scale up.

74. The project will improve on and scale up the integrated approach tested by the GoM with support from Adaptation Fund through UNDP in the islands of Mahibadhoo (Alifu Dhaalu Atoll), Ihavandhoo (Haa Alifu Atoll) and Gadhdhoo (Gaaf Dhaal Atoll)[29]. That programme is in its final year of implementation. The investment to-date has significantly contributed to enhancing the resilience of freshwater supply through the integrated management of ground – and freshwater resources. With US$8,285,000 of grant investment approximately 7,000 inhabitants of these islands now will have safe and uninterrupted drinking water

[29] This was possible with financial assistance from the Kyoto Protocol's Adaptation Fund which provided the GoM financial support to design and implement a project on "Increasing climate resilience through an Integrated Water Resource Management Programme", with technical support from UNDP.

supply through combined sources of harvested and desalinated water. 4,250 m^3 of harvested water storage capacity and 200 m^3 of desalination capacity have enabled a minimum of 20 litre/day of safe water to be supplied per person. This is in line with the Maldivian EPA guidance. An additional US$7.3 million grant from USAID is now replicating the investment with an improvement of having a component to address groundwater recharge and improved septic tanks so as to recover the groundwater reserves.

The main outputs and activities of the project will be as follows:

Output 1: Scaling up an integrated water supply systems to provide safe water to 32,000 people

75. The project will enable 49 targeted islands (across 13 atolls) to put in place an integrated water supply system. The system in each island will integrate locally appropriate combination of the three main sources of water that are currently largely disconnected (harvested rainwater, groundwater and desalinated water). Doing so will generate the necessary diversification and redundancy in the water supply system to ensure there is always a sufficient supply of safe freshwater for the local population at the selected atoll level. All three sources of water will be produced and distributed on the selected islands with large customer base, where desalinated water is necessary to serve as a back-up source, as the rainwater collection is not sufficient to satisfy the growing demands on water. Such an integrated system will be installed in four islands across four out of seven atolls of the northern, most vulnerable region. At the same time, these four target islands become the water production and distribution hubs for all seven northern atolls during the dry season, lifting their dependency on Male'. The islands of Nolhivaranfaru (Haa Dhaalu Atoll), Dharanvandhoo (Baa Atoll), Foakaidhoo (Shaviyani Atoll), and Maduvvavri (Raa Atoll) have been selected on the grounds of large populations, growing demands for water and vetting through extensive consultations with the government stakeholders and based on the selection criteria as presented in the Section E4.1 of the GCF proposal. They are all located in the North, where the issues of aridity and water shortages are most prominent. These integrated systems will provide water supply for household consumption. Small and remote islands of the Maldives are not suitable for the conduct of industrial activities nor for an extensive agricultural sector. Agricultural activities (if any) would take place at the household level for household consumption.

76. Additionally, 45 islands (20 islands across 4 atolls – out of the 7 - in the north and 25 islands across 7 atolls – out of the 9 – in the south) will benefit from improved rainwater collection infrastructure combined with ground water improvements. As the 45 islands are smaller islands with limited population, desalination on these islands will not be commercially viable. Consequently, each of the four islands will become a hub for producing and distributing water to the islands across all 7 northern atolls, as the need arises, in those particularly dry years when rains fail. This atoll-based system of water production and distribution will eliminate the need for additional emergency water supply during the dry seasons that is currently delivered through a Male' -based, centralized and ineffective, untimely, and costly distribution mechanism. Hence island and atoll-level water self-sufficiency is a main transformative achievement of the proposed project.

77. One of the indicators of success for this project is a year-round, uninterrupted supply of potable water that will be the main impact of the proposed project. The primary supply will be rainwater, complemented by groundwater, and the more expensive desalinated water as a backup supply when and if harvested water runs out at the more populated islands or growth centers. Treated rain water together with desalinated water will be combined in a clean water tank providing storage over two weeks. Collected from the roofs, the rainwater is collected in a tank, treated and transmitted to a mixing tank with desalinated water. The treated rainwater and desalinated water will be blended in varying proportions according to the season and the availability of rainwater. Purpose-designed drains will be put in place to enable excess rainwater from the communal system to infiltrate and recharge the groundwater (groundwater resource management is addressed more comprehensively under Output 3). In addition, consideration will be given to protecting critical infrastructure from island overtopping events by providing higher platform levels and dykes.

78. During the first quarter of the implementation the project will carry out island-level baseline assessments (to establish current quantities and quality of water supply, customer satisfaction and technical and management deficits) as a basis for performance monitoring as well as the community engagement strategy, and for identifying and delivering detailed training and management system needs.

Further details of the integrated design are as follows:

79. Rainwater harvesting: World Bank analysis[30] of rainwater supply in the Northern, Central and Southern regions of the Maldives as well as the length of the dry season in the three regions led to findings that if rainwater tank capacity is increased where possible from 2,500 liters to 5,000 liters in south islands, 7,500 liters in central islands and 10,000 liters in northern islands, even large households with small roof catchment areas would have adequate drinking water supply through dry periods. Space limitations will dictate the extent to which it will be possible to supply all drinking water from harvested rainfall. A detailed island-specific assessment for rainfall harvesting (future water demands, geo-technical, roof area available, space available to install tanks, rainwater collection system, hydraulics, treatment design, land availability etc.) will be undertaken to determine the likely ranges of yields from rainwater, as well as the most cost-effective configuration of tanks, pipes, pumps, drains and storage facilities to cope with low rainfall years and high rainfall events.

80. Rainwater collection system is entirely gravitational and does not require energy inputs. Water goes through gutters and downpipes into the collection tank to be blended with desalinated water. As desalination technology is expensive per unit of water produced by increasing a share of harvested rainwater into the mix a total cost per litre of water delivered to the households will be reduced.

81. Desalinated water: Studies conducted in Maldives have shown that in larger islands with population of at least 2,000 people, rainwater collection and storage will be insufficient to satisfy the growing demand. Therefore, with currently depleted groundwater resources, desalination has become the only alternative means for providing freshwater. Water security in the four highly populated target islands therefore requires an RO plant as part of its integrated water resource management - IWRM system. The RO plants will be operated by a water utility that has been mandated to deliver, operate and maintain water services in the islands. The four selected islands for this project fall under the utility company FENAKA. The contracting company under the project will install and run the plants for 1 year after the installation. During this one year period the plants will be handed over to the designated utility and the staff will be trained for the operations and maintenance of the plants. Desalinated water production at these target islands will also serve as an atoll-based water production and distribution hub for the islands in the vicinity during dry seasons (further details provided in output 2). For the 4 larger islands a life-cycle cost analysis will be carried out to determine the optimal sizing for desalination plants to meet the required capacity in terms of the amount of desalinated water that needs to be produced per day, taking into account all energy efficiency design potentials as well as expected variation in rainfall quantities. Larger plants can produce a given amount of water in fewer hours but are costlier in initial capital cost. Benchmarks can be taken from feasibility assessments for other islands where comparable investments have taken place and proven successful. For example, in Hinnavaru island (supported by USAID), for a population of 5850 by 2050, two desalination plants of 50 m^3/day will be installed together with an existing 30 m^3/day plant. The other main expense involves the operating costs, of which energy is the main sub-component, even for the more efficient membrane technology (compared to thermal technology) that this project will enable the GoM to put into place. The Hinnavaru feasibility assessment shows that the solar PV option is the least expensive and coupled with a 24-hour RO operation, can produce a payback of 8 years. Based on calculations, cost of electricity produced using diesel fuel is about US$0.35 kwh, whereas with solar PV it is US$0.10 kwh. Hence electricity produced using solar PV is 70% cheaper than electricity produced using conventional fuel (MEE,

[30] World Bank (2013) Synthesis study of water security in the Republic of Maldives

2015). This will result in significant reduction in operating costs, the savings from which could be utilized to cover O&M recurrent costs for next 20 years.

82. Based on the evidence from the Dhuvaafaru island and data submitted from the MWSC, the following assumptions can be made:

Total capacity	50 CBM
Total no. of operating days/ month	11 days
Monthly water production	355.7 CBM
Monthly running hours	211.5 hrs
Monthly electricity consumption	2195 kWh
Average no. of operating hours/ day	19.23 hrs

Table 3: Comparative cost estimation for three RO energy input options

Description	Grid connected system		Stand alone with battery		Conventional	
Solar PV installed capacity	20	kW	55	kW	NA	
Monthly electricity production from Solar	2400	kWh	6600	kWh	NA	
Battery	NA		26144	Ah	NA	
Investment cost	50,000	USD	157,000	USD	NA	
Tariff	0.10	USD	0.33	USD	0.35	USD

83. Currently, conditions are conducive to achieve significant energy cost reductions in the RO desalinated water production systems. In this context, with financing from the Climate Investment Fund, the Maldives is one of the six pilot countries participating in the Scaling up Renewable Energy Program in Low Income Countries (SREP). This consists of two complementary investments:

(i) "Preparing Outer Islands for Sustainable Energy Development (POISED)". This program will be administered by Asian Development Bank (ADB). The total investment of this program is about US$120 million. The aim of the program is to upgrade existing energy generation and distribution systems and install solar PV by at least 30% of the day-time peak load in each inhabited island; and

(ii) "Accelerating Sustainable Private Investments in Renewable Energy (ASPIRE)". This program is administered by the World Bank (WB). The total expected investment is about US$60 million. The aim of this program is to create conducive environment for private investors and install up to 20MW of solar PV roof mounted systems in selected inhabited islands.

84. These investments target 192 islands. As a result of this investment, about 58GWh/year of electricity would be generated, and the share of RE would be increased by approximately 16%. However, in order to increase the percentage of RE installations and to reduce cost of energy requirement for RO water production, it is important to install additional RE electricity generating facilities targeting to meet energy demand for the RO water production. According to a forthcoming net metering regulation excess energy produced from RE installations will be fed directly into the grid and accordingly deducted from consumption. Alternatively, excess energy can be stored in batteries. Three options of electricity consumption are viable; from grid, grid tied and off grid with batteries.

85. Groundwater: A recent assessment of freshwater lenses in Maldives confirms that ground water, if properly protected from land-surface derived contamination, over-pumping and associated salinization,

can be a valuable source of water for Maldives, especially the larger islands[31]. There have been many assessment in Maldives that have confirmed the importance of the island groundwater resource in building a resilient, integrated water supply system (Arup, 2014). The aquifer is an important facility to store water in times of excess for recovery in times of shortage; this storage will become all the more important considering the expected increased rainfall variability and intensity (see section B1 for details). Aquifer recharge will also limit and prevent salt water intrusion. The freshwater resource is highly dependent on rainfall, so conjunctive use of ground, rain and desalinated water will need to be a dynamically managed system taking into account forecasted rainfall.

86. There are two ways to restore the aquifer water balance: increase recharge or reduce extraction rates. There are three ways the project will recharge the aquifer, based on detailed aquifer studies and related technical assessments on the target islands: i) management of storm water run-off (flooding) by installing drains soak way and other features; ii) re-routing RWH 'first flush' and excess roof overflows to ground via soak ways and other recharge features (interceptor pits, trenches, infiltration galleries, filter drains etc.); and iii) re-routing of grey-water- separation of greywater at the household level would need to be assessed for feasibility. The integrated RWH – groundwater recharge design requires sufficient storage capacity in the RWH in order to better regulate and monitor flows, for example, to enable some delay in recharge when necessary due to a lack of aquifer space just after the rains. Fitting of automated cut-off valves would avoid overflow-induced flooding and issues related to clogging and maintenance. Recharge structures should make use of locally available materials for pre-filtration wherever possible. Detailed island level assessment of groundwater yields will need to be carried out considering also population densities[32].

87. The GoM has set aside a budget to install sewage systems in most of the selected atolls, which provides baseline financing for this investment. In fact, for the 45 islands selected for RWH, 12 islands have on-going or planned sewage projects either through Government investment or grants/loans. Overall, the Government has US$148.4 million financing towards sewerage for the period 2015-2017 through both grants and loans (as previously mentioned, government budget of US$77.69 is dedicated to sewerage networks). Therefore, the GCF investment is timely to complement into the water production and distribution systems that experiences major funding shortfalls.

88. The project will also enable the GoM to design transparent and consistent tariff evaluation criteria and tariff setting guidelines. The current increasing block tariff system applied in Male' provides a good example of workable tariff structure for the islands. This type of structure includes both a lifeline tier for poor households and a conservation incentive for large water users. Tariff policy that adheres to the principles of affordability, equity, and financial sustainability of the integrated water supply system in the long run will be introduced. Furthermore, the measures towards the reduction of production costs, as described above, the improvements in service provision and quality management systems set up at the utilities, will enable a conducive tariff structure to facilitate the recovery of operations and maintenance costs.

89. Management of the integrated water supply system (the government in Maldives has labelled it as IWRM) has to happen at various levels, most obviously by the public utilities (e.g. FENAKA and STELCO) who have responsibility to serve a number of Atoll islands. At the same time, communities in the islands and the regulatory authorities at the decentralized and central government levels also have a key role to play. Currently, the levels of disenfranchisement of the current service provisions is high and the capabilities to plan and manage service provision effectively is low. This downward cycle will be turned around through this initiative. Management capacities will be strengthened and optimized in order to ensure that investments made now and in the future are financially and operationally sustainable. Targeted capacity

[31] Bailey, R.T., Khalil, A, Chatikavanij, V., (2014) Estimating transient freshwater lens dynamics for atoll islands of the Maldives. *Journal of Hydrology* 515, pp247-256

[32] Population densities matter in the calculation of sustainable groundwater yields. A recent WB synthesis study of water resources in Maldives took the view that population densities of greater than 20 per hectare pose a risk to groundwater.

development will take place in three ways: i) Meaningful and well planned community engagement with households and island authorities to get their participation will be essential to making the integrated system work effectively, especially in the context of willingness to pay for the system; community engagement will be facilitated through the existing Island Council mechanism, including through such representative community groups as women's development committees that have mandate to provide inputs into the island development plans and individual projects; Women's development committees will be used to voice women's specific needs in water at the household level, use of their traditional methods of harvesting and promote their roles in household "willingness to pay" surveys and related decisions. Since water scarcity directly affects women by adding to their daily chores, they will more willingly secure family earnings for a reliable freshwater supply; Furthermore, a dedicated water task force (see output 3) at each Island Council will serve as a platform for participatory decision-making for an entire project duration and beyond; ii) Training programmes addressing the main management barriers together up-grading of management information systems will enable proper planning and financial management (targeted training and mentoring programmes, including a sustainable training facility at the Maldivian Polytechnic Training Institute will be established and rolled out); An equal number of female professionals will be trained alongside male peers and colleagues; and iii) Development of regulatory control through SOPs, quality standards and guidelines will enable the application of the principles enshrined in the legislation around safe water and sanitation for all. The capacity development and the development of regulatory control will enable replication to other islands and Atolls thereby multiplying the benefits of the investment over a larger population.

90. The following concrete results will be delivered under this output:

1.1. 11,502[3] rainwater harvesting systems for 26,000 residents in 45 islands installed;
1.2. Standard operating Procedures (SOPs) prepared and used by utilities, local councils and households;
1.3. 4 RO desalination water plants in 4 islands installed and made operational, using a grid-tied and / or off grid solar PV technology to provide backup capacity in times of water stress;
1.4. Groundwater recharge system installed for excess rainwater from the RWH collection system on 49 islands, including greywater recycling on selected islands;
1.5. Tariff evaluation criteria and tariff setting guidelines designed and introduced;
1.6. Training programmes in integrated water resource management, planning and budgeting, water economic modelling, expenditure management and performance monitoring developed and delivered for relevant atoll and island councils and the ministries (MEE, MoH) and public utilities; and
1.7. Certification courses for the utilities and sector specialists in the areas of water engineering, capital construction, operation, maintenance, financial management and planning.

Output 2: Dry Season water production and distribution

91. The quantities of emergency water are small as a proportion of rainwater available/harvested and could be accommodated at the island level through more widespread rainfall harvesting, as well as atoll-level desalination. Given the number of inhabited islands in Maldives (186), developing these integrated solutions across all Atolls and islands will be a longer-term prospect. In the shorter term, island level supplies will probably need to be supplemented by desalinated water supplies external to the island most preferably at a decentralized, atoll-level to reduce the transportation cost as well as to improve the timeliness of water delivery. The average cost over the last three years for emergency water costs has been US$93/m^3 (about 16% of average income in 2012 in the outer islands), compared to tariff rates that are closer to USD10/m^3, so this difference in price is a significant additional cost to GoM annually. A major portion of the cost is transportation costs – around 10 times more than the amount spent on purchasing the water from suppliers in the capital island of Male'.

92. Currently, water is supplied based on the amount requested by the island councils, in batches. When a request is made, the government evaluates the request and prioritizes based on the most urgent need. The task is then outsourced to the lowest bidder through a competitive procurement process. The dry season water supply relies on the RO desalinated water produced in Male' atoll for collection and distribution to all affected islands (with few exceptional industrial islands where the water can be collected, sub-regionally). This is because water production is currently concentrated in Male' and larger Male' atoll islands with high population density and big customer base. Such centralized operation is not only costly but also and most importantly precludes timely delivery to the people in need. The timeliness is also hampered by current tender and contracting regulations that require separate tender process for each individual cluster of islands. In 2015) NDMC has gone through more than 14 tender processes in order to supply the affected population. There are only handful companies that can bid and deliver for such services, therefore they push the prices high, leaving the government with limited negotiation leverage.

93. If the regulation is adjusted to allow for a long-term agreement for whole sale services, the companies with secure contracts will no longer inflate the price of water and transportation and cost of operation is expected to lower. Economic analysis shows that that If the collection points are decentralized across the atolls, especially in the dry North, it will significantly reduce the cost of operation at least by half. It is expected that Output 2 would improve the cost/m^3 of drinking water and the response times during dry seasons for Maldives as a whole. As an indication of the size of the beneficiary population, in 2014 emergency water was supplied to islands with a combined population of nearly 60,000, or 17.5% of the Maldives population.

94. The GCF funds will be used to improve regulatory frameworks and institutional set up governing the dry season water supply in the country (not just the 4 Atolls included in Output 1). Regulatory acts on water delivery tendering procedures and sub-laws on institutional coordination and accountability mechanisms will be devised and enacted. The decentralized, atoll-based water supply and distribution points developed under output 1 will serve as water production and distribution points for all 7 northern atolls. These new decentralised water production and distribution points will follow the existing mechanisms (logistical setup and infrastructure) for emergency water supply during the dry period, but with a considerable improvement by shifting from centrally operated to a decentralised system, closer to the beneficiary communities, thereby reducing costs drastically. With the establishment of integrated water resource management systems in the 4 regional atolls, the water production capacities will increase at the atoll level and make the water available for a timely distribution during the dry seasons. SOPs will be developed between the relevant institutions such as the utilities, councils, NDMC and MEE to establish a clear and streamlined water distribution operations.

95. In addition, a timely water alerts and forecasting will help to achieve effective water management planning decisions such as building up emergency stocks of desalinated water. The Maldives Meteorological Service (MMS) under the MEE will be involved in water alerts as well as long term projections and forecast to feed into the water sector SOPs. The project will improve the density of the rainfall observation network by procuring additional rainfall gauges. Four additional rainfall gauges – precipitation sensor "Rain(e)" with Data Logger - on pre-identified locations (HA, GA and GDh atolls) of wide spread will considerably improve the granularity of the observations in the vulnerable outer islands. Currently, there are five rainfall gauges placed across the country. With the additional four gauges located strategically within the GCF project areas will expand the coverage and improve observation data collection. This in turn will improve accuracy of forecasting as well as seasonal water alerts. The data is collected at the main Meteorological Watch Office (located at the Ibrahim Nasir International Airport in Hulhule' island in Kaafu Atoll). The data from the additional rainfall gauges will supplement the hourly data collected from the five meteorological centres spread across the country. MMS staff will be trained in data analysis and forecasting methods. Observation data sharing between such relevant institutions as NDMC and MMS will result from an improved connectivity to MMS database as well as systematic data sharing protocols. Finally, emphasis will be placed on timely water alerts to the grassroots level and dry season preparedness campaigns lead by women who are most acutely affected by the water shortages.

96. With climate change impacts accelerating, the effectiveness of dry season water distribution is a critical adaptation strategy in the water sector.

97. The following concrete results will be delivered under this output:

2.1. 4 sub-national water production and distribution locations to serve all Northern atolls established;
2.2. Institutional coordination and accountability mechanisms between the utilities, the NDMC, MEE and LGA/ councils to facilitate cost-effective and timely water supply during dry season;
2.3. Regulatory framework for competitive and wholesale water distribution services established;
2.4. Early warning system established on the basis of forecasted meteorological information for water emergency alerts and for effective operation of integrated water system.

Output 3: Aquifers recharged and protected

98. This output complements Output 1 in addressing the quantity and quality of the ground water, mainly from the perspective of land-use planning and water quality monitoring. Because of the hydrogeology of the island, the interrelated issues of groundwater quality and quantity can only be addressed by management approaches that encompass the entire recharge/catchment area, which can mean the whole island.

99. Firstly, an assessment of geological, hydrological and land-use information is needed to understand the aquifer vulnerability and the range of human activities which exert pressures over water resources. Groundwater is very poorly researched in Maldives; the project will be used to address this critical gap in knowledge. The results of the analysis, to be undertaken by GoM will help to unlock the resource potential critical for long term water security of the country. This field-based assessment will provide a direct contribution to the formulation of subsidiary mechanisms for the implementation of the upcoming Water Act that based on previews, will have a strong focus on groundwater protection and management.

100. Secondly, it will be necessary to undertake water quality monitoring and to set up and maintain an information inventory. Quality monitoring is critical for reviving the groundwater resource as a safe source of water that has been lost after the tsunami catastrophe of 2004. Monitoring is also critical for continuous SLR monitoring, based on the salinity levels. Groundwater monitoring protocols, equipment and training will be delivered. Measurements for both groundwater level and quality are equally important. Partnership between FENAKA and the health centres in the outer islands will be initiated. Protocols will include which parameters to be measured at which interval in time. It will also detail out how samples for measurement should be acquired and recorded. This will involve basic water testing equipment to check for contamination and minerals content. The professional training in groundwater statistics and monitoring compliance will be delivered to the professional personnel (equally to both women and men professionals) at the EPA, utilities and health centres. Trainings will be designed to help users without deep statistical expertise to understand the statistical techniques and methods related to groundwater management, including replenishment and cleanup and how to use them in all life cycle stages: release detection, site characterization, remediation and monitoring. A web-based technical and regulatory guidance will be provided to bring clarity to the planning, implementation, and communication of groundwater management through statistical methods to lead to greater confidence and transparency in the use of groundwater site management. The project will also enable the Government to examine in detail options for developing and introducing full or partial cost-recovery based models of water delivery and distribution in the future. That said, the island resident's willingness to pay for water and sewerage services depends on first seeing and experiencing obvious improvements in water quality and accessibility on the island. Communities realize that water quality is a problem and they have also emphasized the need for a system of monitoring and safeguards, demonstrating a willingness to cooperate[33]. Capitalizing on this momentum,

[33] WHO, 2015

the project will support institutional development such as establishing a water quality task force in each island under the leadership of the island council. The water quality task force will comprise of the members representing the relevant institutions at the island level such as, utilities, women's development committees, and health centres and will be a voluntary body, hosted by each island council, as part of the extended advisory body to ensure a full stakeholder engagement in local water access and safety decisions as well as serving as a mechanism for participatory monitoring of results delivered by water projects and investments. Role of women's development committees at Island Councils will be particularly prominent to empower women's role in stewarding groundwater protection and greywater collection for subsequent treatment and use for groundwater recharge. The community engagement detailed under Output 1 will also include discussion around land use controls and restriction of activities that negatively affect groundwater quality, as the basis of water safety plans on each island. A public information campaign will be designed and run.

101. Thirdly, the recharge rate and water quality change in the vicinity of the recharge structure will be evaluated in each of the recharge areas. The quantity of water entering each recharge structure implemented in Output 1 would be monitored for flow rate and integrated volume. Water level in the well would be recorded using a water level logging device such as a pressure transducer. Aquifer recharge methods discussed above will be undertaken.

102. Fourthly, improved land use planning will also be guided by the protection of catchment areas (preservation of green zones etc.) to allow the rainwater to permeate into the underground lenses for natural replenishment process. Land-use planning guidelines will be updated in a fully consultative way with communities, island authorities and central government to include groundwater recharge requirements.

103. The following concrete results will be delivered under this output:

3.1. Baseline assessment (hazards inventory and catchment characterization) completed;
3.2. Groundwater monitoring protocols with associated equipment and training delivered;
3.3. Regulatory framework established for coastal land use, including zoning to protect coastal catchment areas and enable natural recharge of groundwater lenses.

More details about the activities and results are found under the section VI. Project Results Framework of the Prodoc or section H.1.2. on Log frame of the GCF proposal.

ii. *Partnerships:*

104. The project will be implemented in partnership and close coordination with other relevant programmes and investments in the water sector carried out under the Ministry of Environment and Energy in Maldives. In particular, those ongoing or planned investments that target the same atolls and islands and extend the sanitation networks. The coordination will take place through the technical committees to be set up as part of the project implementation structure. Furthermore, the project will partner with relevant agencies under the second component of the project that deals with emergency water supply; MMS – for the installation of rainfall gauges to improve rainfall data management and distribution for seasonal water alerts. The project Management Unit will systematically seek for new opportunities for innovative partnerships with government, community and private sector organizations.

iii. *Stakeholder engagement:*

Table 4: List of key stakeholders

Name	Role in the Project	Participation Plan
Ministry of Environment and Energy	MEE is the Implementing Partner – IP of the project. Department of Water and Sanitation of the MEE hosts the project and stemming from its mandate provides the institutional leadership across all aspects of project implementation and provide data on water shortages as well as measures to increase community based resilience.	Department of Water and Sanitation will be part of the Project Board and coordinate participation of all other relevant departments of the MEE. It will be represented at the technical committee and will lead on coordination with other government entities, including water utilities and island councils. It will act as responsible party under the project's component two that concerns with an effective design and delivery of the emergency water distribution mechanisms and associated capacity needs, including regulations, procedures, protocols and local infrastructure. It will be represented at the technical committee and provide data on water shortages as well as measures cost-effective and timely delivery of water during the periods of water shortages. Board will meet annually; Technical Committee will meet biannually.
	MEE is the Implementing Partner – IP of the project. Department of Climate Change of the MEE provides overall climate change adaptation advice, input and guidance.	Department of Climate Change will be guiding the project through the MEE in relation to climate change risks to the water sector and kinds of capacity development and services that are required to minimize the adverse impacts of climate change on water production and supply systems. NDA who is hosted by the Climate Change Department will be represented on the Project Board. The Department will also be the main point of contact with GCF and other external engagements related to GCF. It will also be represented at the technical committee and will

Name	Role in the Project	Participation Plan
		support the water department on coordination with other government entities, including water utilities and island councils.
	MEE is the Implementing Partner – IP of the project. Department of Energy of the MEE provides advice, input and guidance on the renewable energy aspects of the project.	Department of Energy will be supporting the project through the Water Department of MEE in relation to solar energy application to the water production system through the RO desalination plants. It will be represented at the technical committee and will support the water department on coordination with other government entities, including water utilities and island councils.
Environment Protection Agency	EPA is the lead environmental agency for the country. EPA provides regulatory environmental standards, quality assurance, monitoring and oversight and technical expertise.	EPA will be part of the Project Board. It will be represented at the technical committee and provide regulatory environmental standards, quality assurance, monitoring and oversight and technical expertise. It will play particular role in relation to safeguard policies and water quality standards for groundwater reserves.
Ministry of Health	Ministry of Health is the lead agency for public health. Stemming from this mandate, the ministry will provide the standards for water in ensuring public health and safety.	Ministry of Health will be part of the Project Board. It will be represented at the technical committee and provide the standards for water in ensuring public health and safety.
Ministry of Housing and Infrastructure	Ministry of Housing and infrastructure has the authority to issue land in the project islands.	Ministry of Housing and Infrastructure would be part of the project technical committee.
National Disaster Management Centre	National Disaster Management Centre is the main government coordination body for emergencies. NDMC will provide complementary data on water shortages as well as measures to increase community based resilience.	National Disaster Management Centre will be part of the Project Board. It will be represented at the technical committee and provide data on water shortages as well as measures cost-effective and timely delivery of water during the periods of water shortages.

Name	Role in the Project	Participation Plan
Local Government Authority	Local Government Authority is the main government coordination body for decentralization and development planning.	Local Government Authority will be part of the Project Board. It will be represented at the technical committee and provide local development priority areas and support in coordination of project activities through the Island Councils.
Atoll Councils	Atoll councils are responsible for the coordination of development activities in the atoll.	Atoll councils will be part of the local level consultations for the project islands that fall under their mandate.
Island Councils	Island councils have responsibility for land allocation and local input to infrastructure design as well as community engagement.	Island councils will be engaged throughout the initiation, mobilization, construction and handover of the project outputs.
State Owned Utility providers	STELCO, FENAKA and MWSC would be involved in providing local insight into water projects in the country. They would also advise on local best practices and lessons learned.	STELCO, FENAKA and MWSC will be part of the project Technical Committee.
Women's Development Committees	Piped water system will profoundly improve women's and men's lives by removing the drudgery of collecting water from wells and taps and freeing time for education, children and other economic, social and cultural activities. This supports the investment proposal for a piped water supply as part of the IWRM solution. Women, who are largely responsible for bringing up children and would experience firsthand the impacts of ill health from polluted ground water supplies could be important agents for change to support a safe and affordable service delivery system and associated tariffs.	Women's development committees will be used to voice women's specific needs in water at the household level, use of their traditional methods of harvesting, use of water efficiently, and promote their roles in household "willingness to pay" surveys and related decisions on affordable tariff setting;

iv. *Mainstreaming gender*:

105. Gender analysis was conducted prior to GCF Board approval for this project. Results from the consultations are detailed in the Stakeholder engagement section and reflected in the Gender Action Plan found in Annex A of this proposal. Highlights on how gender will be mainstreamed into project implementation are provided below.

106. Prior to implementation of water infrastructure investments on each individual island female-headed households will be identified and documented as project beneficiaries. All household surveys will be gender disaggregated. At all Island and Atoll meetings an equal participation of women will be demanded. Meaningful and well planned community engagement with households and island authorities

to get their participation will be essential to making the integrated system work effectively, especially in the context of willingness to pay for the system; community engagement will be facilitated through the existing Island Council mechanism, including through such representative community groups as women's development committees that have mandate to provide inputs into the island development plans and individual projects; Women's development committees will be used to voice women's specific needs in water at the household level, use of their traditional methods of harvesting and promote their roles in household "willingness to pay" surveys and related decisions. Since water scarcity directly affects women by adding to their daily chores, they will more willingly secure family earnings for a reliable freshwater supply; furthermore, a dedicated water task force at each Island Council will serve as a platform for participatory decision-making for an entire project duration and beyond.

107. The island and atoll-specific baseline studies will analyze in detail the women-specific water issues and the opportunities of women's empowerment through the solutions (e.g. stewarding groundwater, household level maintenance and promotion of water efficiency at a household level). The secondary data from past and ongoing water projects in Maldives that can be used to establish baseline and in setting targets to address gender equality particularly on access to training, and other benefits. The project design and implementation will take into consideration the following gender implications:

- Specific strategies to include / target female-headed households;
- Differing conservation incentives faced by women;
- Identification of gaps in gender equality through the use of sex-disaggregated data enabling development of a gender action plan to close those gaps, devoting resources and expertise for implementing such strategies, monitoring the results of implementation, and holding individuals and institutions accountable for outcomes that promote gender equality.
- Advocacy and awareness is adjusted to most effectively reflect gender-specific differences. Strategies used in the project are then tailored, taking into account such differences;
- Inclusion of a Gender Specialist position / provision of advice within the project to implement gender related activities.

108. During project implementation, qualitative assessments will be conducted on the gender-specific benefits that can be directly associated to the project. This will be incorporated in the annual Project Implementation Report, Mid-Term Report, and Terminal Evaluation. Indicators to quantify the achievement of project objectives in relation to gender equality will include men and women who had access to affordable solutions, number of men and women employed from the jobs created by the project, training opportunities, knowledge management and information dissemination.

v. *South-South and Triangular Cooperation (SSC/TrC):*

109. Opportunities for cooperation will be identified to assist the government in attracting private sector finance and further the knowledge and technology transfer through the south-south cooperation in the region.

vi. *Knowledge:*

110. Implementation of concrete adaptation actions on the ground will constitute the primary learning experience, which will feed into all awareness, training and knowledge management actions facilitated and conducted by the project. More specifically the project will design and deliver training programmes in water management, planning and budgeting, expenditure management and performance monitoring for relevant atoll and island councils and the ministries (MEE, MoH). Additionally, certified courses for the utilities and sector specialists in the areas of water engineering, construction, operation, maintenance, financial management and planning will be introduced at the Maldivian Polytechnic training institute. This will enable an iterative learning process that will support the sector by developing a cadre of professionals who can

support the sector. Additionally, awareness raising and advocacy works will be an integral part of all island-level project activities.

V. FEASIBILITY

i. Cost efficiency and effectiveness*:* .

(E.6.1 para 132-136)

111. Cost effectiveness will be ensured with the following factors:

- Use of solar PV for energy generation to reduce the costs of operation the RO plants and pumping;
- Design an integrated system for optimality of water resources consumption – use the cheapest water supply option first (i.e. RWH);
- Maintain option value of ground water resources through coastal protection – insurance against extreme events in the future.

112. Efficiency:

- Base it on good practice and locally tailored solutions so that services delivered are effective and affordable.
- A fair and affordable tariff structure should be established to improve service standards and investment in the system over time. Willingness to pay the tariffs will be promoted through dialogues and participatory planning processes with communities to shape the system design.

113. Improving and scaling up of proven, RE enabled Integrated Water Supply System options in Maldives that are well adjusted to local (island and atoll level) geographic, hydro-climatic and socio-economic conditions will offer the most effective and efficient solutions to climate change induced water stress. In order to grant sustainable operations and drive additional investments the water tariffs will be restructured that are set at maximum cost-recovery rate for operations and maintenance, affordable, flexible and indexed in major cost component such as energy. Results of preliminary financial analysis of a Grid-Tied Solar PV RO Desalination system and a typical RO desalination system using electricity from diesel grid have been undertaken.

Item	Value	Unit
Water demand	100	litre/person/day
Target Population Size	1,000	person per RE-WS System
RO System Capacity	100	cubic meter/day
RO System with Diesel Grid		
CAPEX: RO Plant	2,320	USD/m3/d
OPEX: Other than electricity	0.32	USD/m3
Electricity Tariff + Subsidy	0.31	USD/kWh
Electricity Input	4.30	kWh/m3
Project Life Time	25	years
Levelized Water Cost	2.10	USD/m3
Grid-Tied Solar PV		
CAPEX	3,000	USD/kW
Cpacity Needed	20	kW
OPEX	3	% of CAPEX
Converter Overhual	15	% of CAPEX every 10 years
Panel inefficiency	1	% per year
Hour with sunshine	7	hr per day
Project Life Time	25	years
Levelized Cost of Electricity	0.14	USD/kWh
Total Electricity Cost (PV+Grid)	0.26	USD/kWh
Grid-Tied Solar PV-RO System		
Levelized Water Cost	1.89	USD/m3
Cost Saving	0.21	USD/m3

114. Based on available data[34] for Maldives and assumptions taken from recent IRENA study[35] show that because of a lower Levelized Cost of Electricity (LCOE) from Solar PV (US$ 0.10/kWh versus US$0.35/kWh from diesel grid in Maldives), a 10 per cent reduction in a unit cost of water production can be achieved by adding a Grid-Tied Solar PV to a typical RO desalination system. It should be noted that the distribution and administration costs are not included in the analysis as these costs are the same for both water production systems. Promoting the energy efficient and renewable options for the Reverse Osmosis (RO) water production will also offer a positive change in cost-benefit equation by reducing lifecycle energy cost by adding a grid tied RE, especially solar PV, to the WS system. With 8 hours of sunlight, approximately 20% energy cost reduction can be achieved. In a short term a mobile RO unit could be an effective option in providing necessary water during the dry season in an emergency case (see also Section C.3 of the GCF proposal for additional analysis conducted by the Energy Department of the MEE). Subsequently, the economic analysis demonstrates that the economic net present value is positive and that the economic rate of return is greater than 20%. However, financial analysis showed that financially the project is not viable without granting the capital cost. Therefore, cost-recovery is only possible on operations and maintenance costs, provided that capital investment is covered through the grant investment (See also sections E.6.3 and F.1 of the GCF proposal).

115. Furthermore, the decentralized, including the hub-and-spoke model of emergency water production and distribution will significantly (at least by half) reduce the cost of the operation, thus lifting the financial burden over already strained national budget and re-diverting the scarce development resource towards the country's development priorities, especially in the water sector.

ii. Risk Management:

116. The overall risk rating for this project is considered to be **moderate**. A copy of the UNP Risk Log developed for the project is found in Annex B. Note that this risk log also incorporates the risks identified through the enviornmental and social impact assessment completed for the project (see Annex C and more specifically Annex D for the social and environmental risk screening checklist provided by that study)

117. The UNDP Country Office will record progress in the UNDP ATLAS risk log. Risks will be reported as critical when the impact and probablity are high (i.e. when impact is rated as 5 and probablity is 1,2,3,4, 5 or when impact is rated as 4 and probability is rated at 3 or higher). Management responses to critical risks will also be reported in the Annual Project. Highlights of the findings are identified in the subsections that follow:

Environmental risks associated with the Project include:

118. Rain harvesting systems: The risks associated with the installation of rain harvesting systems will be limited to erosion and sediment control. Given the elevation of the atolls, this is unlikely to be a risk. The main risks associated with the rain water harvesting is not securing the foundations of the system, thereby giving rise to the possibility of the tank shifting and potential creating water flow. The risk of this occurring is extremely low as are any associated impacts.

119. Desalinization Plants: Risks associated with the construction and operation of desalination plants include impacts on marine ecosystems associated with the intake of marine water and outfall including on important fishing grounds. By undertaking the relevant studies and community

[34] State Electricity Company Limited
[35] Koschikowski, J. et.al., 2015, Technology Options for Renewable Desalination on Islands Report, International Renewable Energy Agency

consultation, these risks will be reduced significantly. Given the size of the desalination plants, it is unlikely that, in comparison to much larger projects internationally, they will have short to long term significant impacts. The relevant mitigation measures are identified in Section F.3 of the proposal.

120. Ground Water Recharge Systems: The risks associated with groundwater recharge systems are both environmental and social. Environmentally, the risks include changing the biophysical and chemical characteristics that could result in the loss of an important ecosystem. However, without action, local ecosystems are likely to collapse as ground water reserves collapse and/or degrade through seawater inundation.

Social risks associated with the Project include:

121. Political Support: Since water security is the main adaptation priority expressed in national communications, the NAPA and other strategic documents, there is a demonstrated political commitment to ensuring the Project is implemented.

122. Project Sustainability: Furthermore, the government has committed co-financing for operation and maintenance (O&M) in a letter of co-financing. Hence risks associated with the sustainability of the project are considered minimal.

123. Health Risks: Without the project, recharging of ground water reserves with untreated greywater can potentially lead to infectious diseases and contamination, making the groundwater unusable.

iii. Social and environmental safeguards*:*

124. The overall safeguard risk categorization of this project is moderate (see Annex C). As per UNDPs social and environmental standards, the safeguards that were triggered during the project development phase are:

- Biodiversity Conservation and Natural Resource Management;
- Climate Change Mitigation and Adaptation;
- Pollution Prevention and
- Resource Management.

125. A risk assessment and proposed mitigation measures can be found in Annex E. The Project Manager is responsible for ensuring risks and the effectiveness of their associated mitigation measures are monitored in accordance with the monitoring strategy in Annex F.

126. Related complaints by communities and people affected by the project can be submitted to UNDP's Social and Environmental Compliance Unit (SECU). SECU will respond to claims that UNDP is not in compliance with applicable UNDP environmental and social policies. Complaints can be submitted by e-mail to project.concerns@undp.org or the UNDP website. Project-affected stakeholders can also request the UNDP Country Office for access to appropriate grievance resolution procedures for hearing and addressing project-related social and enviornmental complaints and disputes. Environmental and social grievances will be monitored and reported in the Annual Project Report. Such issues can also be submitted to the PMU or the Ministry of Environment and Energy and if unresolved amicably the aggreived parties depending on the nature of the problem can submit to the Anti Corruption Commission, or resolve through the national legal system.

iv. Sustainability and Scaling Up:

(D.2 para 87-90)

127. Sustainability of the project lies in its barrier removal strategy that will be three-pronged, namely: i) financial sustainability by promoting an integrated system which is inexpensive to run through expanded use of cheapest water first (RWH), and the use of energy efficient and renewable energy technologies to reduce the cost of desalinated water production; ii) management capacity development to enable efficiency of service delivery by the target utilities into the longer-term; and iii) community engagement and decentralized options for a sustainable and effective integrated water supply system that supplies safe and reliable water at the island level and promotes island level self-sufficiency. Through these measures a cost-recovery and financing of well-defined O&M plans are possible. However, in the immediate and medium term the MEE steps in with the commitment to cover the O&M cost for the next 10 years to secure an uninterrupted and a quality service water supply service to the target households (See Annex XIII of the GCF proposal). The O&M was calculated in the "worst case" scenario of lowest cost-recovery capacity.

128. Developing simple and affordable technologies based on island specific water budget assessments will offer cost effective solutions to island self-sufficiency. This is the core to the project strategy. Rainwater harvesting is a viable solution to meet water production targets inexpensively. Thus, it is prioritized by the project to make households as self-sufficient as possible via combined rainwater and groundwater supply. Projections of increasing rainfall variability, combined with changes in groundwater reserves, suggest that even with increased rain storage capacity (during severe drought periods or other extreme weather events), water shortages will persist. Where desalination is found to be a necessary backup solution for dry season supplies, adoption of sub-regional, atoll level water distribution is the most viable, accruing great social benefits of timely water delivery to vulnerable people in need, as opposed to centralized and costly operation from Male' atoll.

129. Community engagement and participatory planning processes will be undertaken as a key work stream running through all outputs in order to get their weight behind the principle of cost recovery, because the financial viability of the system will largely rest on the ability to recover at least some of the operating costs, with the GoM stepping in with a better targeted subsidy for the rest, especially in the context of outer islands. Community-based financing and solutions for O&M cost-recovery will be viable in the islands with small and medium populations. Furthermore, the current increasing block tariff system in place in Male' provides a good example of a workable tariff structure for the islands. This type of structure includes both a lifeline tier for poor households and a conservation incentive for larger water users. The experiential information that is generated by this investment will serve to input into the methodology being prepared, and subsequent reviews by EPA, tariff setting criteria, performance targets and comprehensive guidelines that will build the utility and potentially the private investor confidence in cost-recovery water sector investment options.

130. Institutional capacity development at the different institutional levels (Utility, decentralized authorities and Central Government) will include continuous certified professional trainings and management system investments in financial management, performance monitoring and planning; these are essential capacity development investments into the sustainable knowledge-base for adaptive water sector development.

v. *Economic and/or Financial Analysis:*

(F.1 para 145-155)

131. The proposed investment is founded on a cost-effective solution that involves expanding the rainwater collection capacities at both household and community level. The purpose of the rainwater harvesting system (RWH) is to ensure the continuous supply of potable water for the population of the 45 selected islands over a period of 90 days. The main benefit of the system is to avoid the transport of potable water from Male' or other locations to the islands currently experiencing water shortages during the dry season and expected to experience increasing water shortages as a result of climate change and as a result

of an increasing contamination of groundwater from both improper sanitation and increasing salinity arising from sea-level rise. Important benefits of the investment include access to safe potable water during the annual shortage period of 90 days and thus avoiding the exposure to health risks. Benefits of the RWH system are at a minimum twofold. First, it is expected that with the RWH system, there will be no need to transport water to the islands (mostly from Male' desalination plant). Hence, avoided water production costs and transportation costs are important benefits of the investment. Access to safe water and avoided health hazards is another important benefit. More specifically price of bottled water that many communities have to purchase during the dry periods are indicative of their willingness to pay for safe and clean water. This willingness-to-pay may serve as a minimum proxy value for all benefits of consuming clean potable water, including the health benefits associated with such consumption and is uniformly set at US$0.2 per 1.5l of incremental clean potable water. Overall, the net present value of the RWH system amounts to approximately US$ 15 million for the selected 45 islands. The investment offers an economic internal rate of return of approximately 27.2%, larger than the discount rate.

132. In addition to RWH infrastructure, RO plants for the desalinated water production will be installed on 4 selected islands of four atolls of the most Northern part of the Maldives. The large population of these islands explain that a RWH approach only would not be sufficient to provide the 90-day potable water supply objective of the Government. The net present value of the entire IWRM component of the project amounts to approximately US$ 8.7 million with an economic rate of return of 20.1%. Key other benefits include health benefits associated with the consumption of treated potable water, and the security of adequate potable water supply. Hence, the quantified benefits of the investment project are expected to be a significant under-estimate of the true benefits of the project.

133. Putting in place additional water production capacities will help meet growing water demands in the country. In the long term, when the groundwater reserves are recovered for potable water use, as a result of a direct contribution of the proposed project, the RO-based water production might be scaled down across the country, assuming that rainfall amounts will sustain rainwater collection and groundwater replenishment at a sustainable level to meet water demands of growing population and economic development.

134. The purpose of the economic analysis is to assess the feasibility of the project strictly from a point of view of economic efficiency. In this analysis, the following parameters were used:

- The RWH and IWRM systems were assumed to have a life time of 25 years with no salvage value at the end of the assumed life time;
- Financial prices were adjusted to economic prices by removing taxes and other forms of government duties;
- Given existing labor conditions in the Maldives, the economic cost of labor (shadow wage rate) was assumed to be the market price of labor;
- A discount rate of 10% was used in the analysis. Please note that, in the absence of guidance in the proposal template on the selection of a specific economic discount rate to use in the economic analysis, all proposals supported by UNDP have opted to use a 10% discount rate, in line with the existing practice of multilateral development banks. Should the GCF request that all proposals submitted for review use the same discount rate and that this rate be other than 10%, we will be happy to revise the economic analysis accordingly.

The benefits of the RWH system are at a minimum twofold.

135. First, it is expected that with the RWH system, there will be no need to transport water to the islands. Hence, avoided water production costs and water transport costs will provide an estimate of the economic benefit of the RWH investment.

136. Second, populations of the islands are regularly exposed to untreated water (collected from household roofs) for drinking and cooking purposes. Anecdotal evidence suggests high frequency of gastro-intestinal diseases and skin diseases associated with exposure to untreated water. However, an initial assessment on a limited number of islands indicates that empirical evidence is not sufficiently adequate to provide an estimate of the economic benefits from avoided health costs which the system would allow. For purpose of estimating the economic benefit of accessing clean potable water, an adjusted price of a bottled water is used as a measure of the willingness-to-pay to consume clean potable water.

137. In addition to the above two benefits, the IWRM system provides a **third** benefit as the IWRM system installed in the 4 islands will also serve as a center for providing emergency water to other nearby islands, thus avoiding transport costs from Male to these other islands.

138. The overall undertaking of the cost-benefit analysis includes the following key steps:

- Step 1: Establishing population projections over the period 2015-2040. Population projections will play a key factor in estimating the cost of the RWH and IWRM investments (the larger the population, the greater the needed capacity of the RWH), and in estimating their benefits (in the absence of the project, the larger the population, the greater the quantity of potable water has to be transported to the islands when shortages occur and the greater the cost of such activity).
- Step 2: For each island selected for investment, estimate the capital cost and O&M cost over the period 2015-2040.
- Step 3: For each island selected for investment, provide the best estimate possible of what could be water shortages over the period 2015-2040 and in so doing, estimate the total transport cost which would have to be incurred in the absence of the project to supply potable water to the islands.
- Step 4: Estimate the benefits of both avoided transport costs and of the incremental quantity of clear potable water.

139. The net present value of the RWH component of the project amounts to approximately $ 15 million with an economic rate of return of 27.2% (Table 5). Sensitivity analysis reveals the investment to be robust to significant increase in cost (20%) and/or decrease in benefits (20%).

Table 5: Base Case and Sensitivity Analysis for RWH Component

Scenarios	NPV ($ millions)	IRR
Base case	15.01	27.2
Cost +20%	11.1	22.6
Benefits -20%	8.5	21.7
Cost +20% and Benefits -20%	6.8	18.0

140. The net present value of the entire IWRM component of the project is lower than for the RWH component but positive and amounts to approximately $ 8.7 million with an economic rate of return of 20.1% (Table 6). Sensitivity analysis reveals the investment to be robust to significant increase in cost (20%) and/or decrease in benefits (20%).

Table 6: Sensitivity Analysis for IWRM Component

Scenarios	NPV ($ millions)	IRR
Base case	8.7	20.1
Cost +20%	5.9	15.8
Benefits -20%	4.2	15.0

Cost +20% and Benefits -20%	1.4	11.4

(See further details of economic analysis in Annex XII of the GCF proposal)

(F.2 para 156-158)

141. The project is targeted to increase access to safe water and demonstrate climate-smart freshwater management schemes in the target islands and replicate practices across the country. In the proposed project, complying with the IWRM Principle of conjunctive use of water resources, potable water is provided by a combination of groundwater, rainwater and desalinated water, which is a new and unique project for the Maldives that has been tested successfully on a smaller scale in the context of three islands with AF funding. And with the GCF funding a greater geographic scope as well as broader improvements in enabling environment for conclusive solution to climate change driven water stress can be achieved. The proposed IWRM project has been designed to cover the selected 49 island communities.

142. The system has been proposed to incorporate rainwater as the primary source of water supplemented by desalinated water during the dry period. In addition, recharge wells have been proposed, expected to improve filtration of rainwater into the water lens. The need to develop, protect, monitor and conserve ground water as a primary source of water as the long-term climate resilient sustainable supply to the community needs and the socioeconomic development, cannot be overemphasized. A Managed Aquifer Recharge (MAR) system is planned to be developed as one of the results and existing wastewater management system with a view to prevent any further pollution of the groundwater. In consideration of the Maldivian context, the nature and magnitude of municipal infrastructure that constitutes a significant component of electromechanical equipment with limited lifespan of not more than 20 years has to be planned meticulously. Thus, it is appropriate to design a water supply system for a mid-term period of about 20-25 years with the option to expand it in the future. Based on this consideration the design horizon for the proposed water supply system has been set at year 2030 that effectively complies with local requirement of minimum 15 years.

143. The existing technically feasible options for producing a quality potable water supply to the inhabitants of the project area are outlined below: 1. Community based rainwater harvesting system; 2. Desalination Plant to secure minimum water requirement in all situations; and 3. Groundwater recharge. Potable water produced from the two independent sources (rainwater and seawater) would be directly connected to the household to realize the ultimate goal of safe and sustained pipe-borne water supply system. The proposed integrated water supply system should essentially embrace the climate independent desalination option due to unpredictable climate-induced rainfall pattern and the polluted ground water. Desalinated water is considered necessary during extreme climatic conditions as well as to supplement potable water from other inexpensive sources. This economically viable approach shall be environmental friendly and involve cost-effectively sound capital investment and minimum affordable production cost (operation and maintenance) to the end users. In view of the contaminated ground water source, the larger section of the population within the supply area needs to be provided with potable water from the proposed water supply systems and thus coverage area shall be 100% and the minimum per capita consumption would be limited to 20litres/day during extreme climatic conditions and emergency situations. This objective would be realized with combined community based rainwater harvesting systems and sea water desalination through reverse osmosis. The designs have been approved by the government of Maldives (MEE and EPA in 2013). These approved designs, feasibility studies are presented as part of this submission (see annex II of the GCF proposal).

VI. PROJECT RESULTS FRAMEWORK

This project will contribute to the following Sustainable Development Goal (s): *6*					
This project will contribute to the following country outcome included in the UNDAF/Country Programme Document: *UNDAF outcome 4: By 2020, growth and development are inclusive, sustainable, increase resilience to climate change and disasters and contribute to enhanced food, energy and water security and natural resource management.*					
This project will be linked to the following output of the UNDP Strategic Plan: Output 1.4: Scaled up action on climate change adaptation and mitigation cross sectors which is funded and implemented.					
GCF Paradigm shift objectives: The proposed project contributes to climate-resilient development pathways in Maldives specifically in the water sector. A year-round self-sufficiency at the target atoll and island level is the main transformative achievement of the project. Such water self-sufficiency will be achieved on the outer islands where the most vulnerable parts of population reside. The sustained impact of project measures will have high potential for replicability and scale potentially covering at least to 61% of total population of the Maldives population.					
	Objective and Outcome Indicators	**Baseline**	**Mid-term Target**	**End of Project Target**	**Assumptions**
SDG indicators	*6.1.1 Proportion of population using safely managed drinking water services* *6.5.1 degree of integrated water resource management implemented*	*Target beneficiaries have no access* *Target beneficiaries do not have IWRM*	*50% of target beneficiaries have access* *50% of target beneficiaries have access to IWRM*	*100% of target beneficiaries have access* *100% of target beneficiaries have access to IWRM*	*Project data will be collated and shared with the national SDG unit within the Ministry of Environment and Energy.*
UNDP Strategic Plan Indicators	*Output 1.4: Scaled up action on climate change adaptation and mitigation cross sectors which is funded and implemented.* *Direct beneficiaries: 105,000*	*No scaling up at current date*	*50% of project completed and delivered*	*100% of project completed and delivered.*	*Overall project progress percentage will be collected from quarterly and annual monitoring mechanisms.*
FUND LEVEL IMPACT:					
Fund level Impact ***A2.0 Increased resilience of health and well-being, and food and water security***	*2.3 Number of males and females with year-round access to reliable and safe water supply despite climate shocks and stresses.*	*Currently no residents (male or female) in the target 49 outer islands have a reliable source of freshwater.*	*50% of target hh have year-round drinking water security.* *(26,791 female and 25,709 male residents)*	*100% of hh in 49 islands have year-round drinking water security.* *105, 000 residents (53,582 female and 51,418 male residents)*	*Sufficient rainfall can be collected to help achieve water security.*

PROJECT OUTCOMES:					
Project Outcomes ***A7.0 Strengthened adaptive capacity and reduced exposure to climate risks***	*Use by vulnerable households, communities, businesses and public-sector services of Fund-supported tools, instruments, strategies and activities to respond to climate change and variability.* *# of households using water supply service delivered.* *% increase in groundwater consumption (quality improvements)* *% of groundwater recharge rate increase*	*No households are currently benefiting from the piped water supply services in the target islands;* *Groundwater quality does not meet freshwater quality requirements (and used for secondary or tertiary use).* *Groundwater quality and recharge rates will be established during the first six months of project implementation.*	*8,000 households on target islands*	*20,000 households on target islands*	*Communities will be willing to pay for a good level of service delivery.* *Sufficient rainfall can be collected to help achieve water security.* *Groundwater can be recharged and the quality can be improved.*
PROJECT OUTPUTS:					
Project Output 1 ***Scaling up integrated water supply system to provide safe water to vulnerable households (at least 32,000)***	*# of hh on target 49 islands receive a year-round safe and affordable freshwater supply (disaggregated by gender)*	*Target island population do not have a reliable and functional water production and supply system, qualifying for annual water emergency supply.*	*At least 4,000 hhs (of which 50% women) on 49 islands receive a year-round safe freshwater supply.*	*At least 6,400 hhs (of which 50% women) on 49 islands receive a year-round safe freshwater supply.*	*Utilities fully adopt new management systems to improve service delivery, including O&M planning.* *Communities' willingness to pay rates are high and conducive for O&M cost-recovery.*
Project Output 2 ***Decentralized and cost-effective dry season water supply system introduced benefiting 73,000 people across the 7 northern atolls***	*# of people receiving dry season water 3 days ahead of need from decentralized, atoll-based water production and distribution hubs.* *% of expected reduction in dry season water supply cost*	*A total annual cost of emergency operation ranges between US$300,000-500,000, depending on number of islands serviced as well as a distance from*	*At least 40,000 people (of which 50% women, across 4 atolls)* *At least 20% reduction in dry season distribution cost.*	*At least 73,000 people (of which 50% women, across 7 atolls)* *At least 40% reduction in dry season water distribution cost*	*Performance results will influence policies and strategies at central government level towards meaningful decentralisation of water and sanitation service delivery.*

		the central supplier - Male'.			
Project Output 3 ***Groundwater quality improved to secure freshwater reserves***	*% increase in Groundwater recharge rate* *% of use of groundwater as freshwater (Groundwater quality improvements against EPA standards)*	*Groundwater quality does not meet freshwater quality requirements and only used for secondary or tertiary use and current recharge rates in target islands are 0%.* *EPA standards for groundwater quality are not met.* *Groundwater quality and recharge rates will be established during the first six months of project implementation.*	*Ground water recharge rates increase by 30%* *At least 10% of increase in groundwater consumption by 20% of households as in integrated water mix in target islands.*	*Groundwater recharge rates maintained at a minimum of 30%.* *At least 20% increase in groundwater consumption by 50% of households on the full IWRM islands as freshwater and / or in integrated water mix in target islands.*	*Results of groundwater recharge and quality monitoring are communicated effectively to recover the trust into the resource.*

In keeping with the UNDP guidelines for GCF funding projects, activities are not presented here. Instead activity and input information contained in the original logical framework has been placed in Annex G.

VII. MANAGEMENT ARRANGEMENTS

i. Roles and responsibilities of the project's governance mechanism:

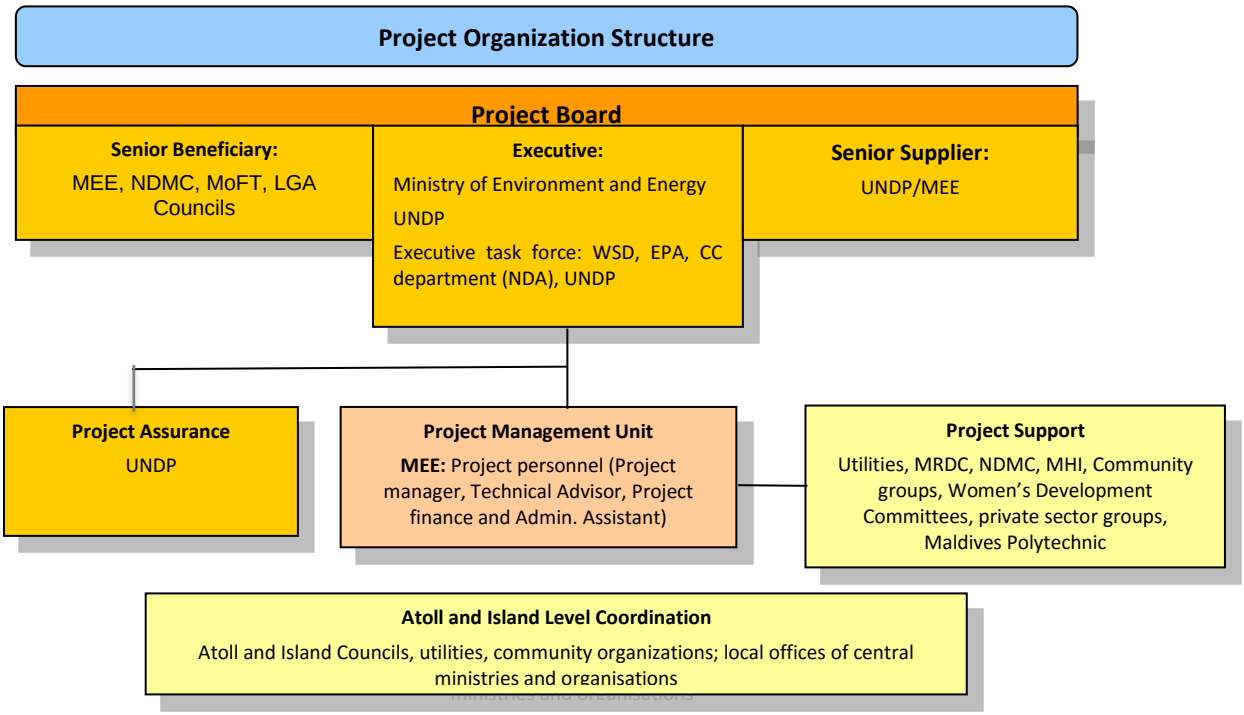
144. The project will be implemented following UNDP's national implementation modality, according to the Standard Basic Assistance Agreement between UNDP and the Government of Maldives, and the Country Programme.

145. The **Implementing Partner** for this project is the Ministry of Environment and Energy of Maldives (MEE). The Implementing Partner is responsible and accountable for managing this project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of UNDP resources. The Implementing Partner is responsible for:

- Approving and signing the multiyear workplan;
- Approving and signing the combined delivery report at the end of the year; and,
- Signing the financial report or the funding authorization and certificate of expenditures.

146. Project-related social & environmental complaints and disputes can also be submitted to the PMU or the Ministry of Environment and Energy and if unresolved amicably the aggreived parties depending on the nature of the problem can submit to the Anti Corruption Commission, or resolve through the legal system.

147. The project organisation structure is as follows:



148. **Project Board**: The Project Board (also called Project Steering Committee) is responsible for making by consensus, management decisions when guidance is required by the Project Manager, including recommendations for UNDP/Implementing Partner approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition.

149. Specific responsibilities of the Project Board include:

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- Address project issues as raised by the project manager;
- Provide guidance on new project risks, and agree on possible countermeasures and management actions to address specific risks;
- Agree on project manager's tolerances as required;
- Review the project progress, and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;
- Appraise the annual project implementation report, including the quality assessment rating report; make recommendations for the workplan;
- Provide ad hoc direction and advice for exceptional situations when the project manager's tolerances are exceeded; and
- Assess and decide to proceed on project changes through appropriate revisions.

150. The composition of the Project Board must include the following roles:

1) Executive: The Executive is an individual who represents ownership of the project who will chair the Project Board. This role can be held by a representative from the Government Cooperating Agency or UNDP. The Executive is: *Minister of Environment and Energy and UNDP Resident Representative.*

   151. The Executive is ultimately responsible for the project, supported by the Senior Beneficiary and Senior Supplier. The Executive's role is to ensure that the project is focused throughout its life cycle on achieving its objectives and delivering outputs that will contribute to higher level outcomes. The executive has to ensure that the project gives value for money, ensuring cost-conscious approach to the project, balancing the demands of beneficiary and supplier.

   152. Specific Responsibilities: (as part of the above responsibilities for the Project Board

   - Ensure that there is a coherent project organisation structure and logical set of plans;
   - Set tolerances in the AWP and other plans as required for the Project Manager;
   - Monitor and control the progress of the project at a strategic level;
   - Ensure that risks are being tracked and mitigated as effectively as possible;
   - Brief relevant stakeholders about project progress;
   - Organise and chair Project Board meetings.

2) Senior Supplier: The Senior Supplier is an individual or group representing the interests of the parties concerned which provide funding and/or technical expertise to the project (designing, developing, facilitating, procuring, implementing). The Senior Supplier's primary function within the Board is to provide guidance regarding the technical feasibility of the project. The Senior Supplier role must have the authority to commit or acquire supplier resources required. If necessary, more than one person may be required for this role. Typically, the implementing partner, UNDP and/or donor(s) would be represented under this role. The Senior Suppler is: *UNDP and Ministry of Environment and Energy.*

   153. Specific Responsibilities (as part of the above responsibilities for the Project Board)

   - Make sure that progress towards the outputs remains consistent from the supplier perspective;
   - Promote and maintain focus on the expected project output(s) from the point of view of supplier management;
   - Ensure that the supplier resources required for the project are made available;
   - Contribute supplier opinions on Project Board decisions on whether to implement recommendations on proposed changes;
   - Arbitrate on, and ensure resolution of, any supplier priority or resource conflicts.

3) Senior Beneficiary: The Senior Beneficiary is an individual or group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the Board is to ensure the realization of project results from the perspective of project beneficiaries. The Senior Beneficiary role is held by a representative of the government or civil society. The Senior Beneficiary is: *MEE, NDMC, MoFT, LGA.*

154. The Senior Beneficiary is responsible for validating the needs and for monitoring that the solution will meet those needs within the constraints of the project. The Senior Beneficiary role monitors progress against targets and quality criteria. This role may require more than one person to cover all the beneficiary interests. For the sake of effectiveness, the role should not be split between too many people.

155. Specific Responsibilities (as part of the above responsibilities for the Project Board)

- Prioritize and contribute beneficiaries' opinions on Project Board decisions on whether to implement recommendations on proposed changes;
- Specification of the Beneficiary's needs is accurate, complete and unambiguous;
- Implementation of activities at all stages is monitored to ensure that they will meet the beneficiary's needs and are progressing towards that target;
- Impact of potential changes is evaluated from the beneficiary point of view;
- Risks to the beneficiaries are frequently monitored.

156. **Project Management Unit**: The Project Management Unit has the authority to run the project on a day-to-day basis on behalf of the Project Board within the constraints laid down by the Board. The Project Management Unit is responsible for day-to-day management and decision-making for the project. The Project Management Unit's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

157. The Implementing Partner appoints the Project Manager, who should be different from the Implementing Partner's representative in the Project Board.

158. Specific responsibilities include:

- Provide direction and guidance to project team(s)/ responsible party(ies);
- Liaise with the Project Board to assure the overall direction and integrity of the project;
- Identify and obtain any support and advice required for the management, planning and control of the project;
- Responsible for project administration;
- Plan the activities of the project and monitor progress against the project results framework and the approved annual workplan;
- Mobilize personnel, goods and services, training and micro-capital grants to initiative activities, including drafting terms of reference and work specifications, and overseeing all contractors' work;
- Monitor events as determined in the project monitoring schedule plan/timetable, and update the plan as required;
- Manage requests for the provision of financial resources by UNDP, through advance of funds, direct payments or reimbursement using the fund authorization and certificate of expenditures;
- Monitor financial resources and accounting to ensure the accuracy and reliability of financial reports;
- Be responsible for preparing and submitting financial reports to UNDP on a quarterly basis;
- Manage and monitor the project risks initially identified and submit new risks to the project board for consideration and decision on possible actions if required; update the status of these risks by maintaining the project risks log;
- Capture lessons learned during project implementation;
- Prepare the annual workplan for the following year; and update the Atlas Project Management module if external access is made available.

- Prepare the Annual Project Report and submit the final report to the Project Board;
- Based on the Annual Project Report and the Project Board review, prepare the AWP for the following year.
- Ensure the mid-term review process is undertaken as per the UNDP guidance, and submit the final MTR report to the Project Board.
- Identify follow-on actions and submit them for consideration to the Project Board;
- Ensure the terminal evaluation process is undertaken as per the UNDP guidance, and submit the final TE report to the Project Board.

159. **Project Assurance**: UNDP provides a three –tier oversight and quality assurance role involving UNDP Country Offices, regional and headquarters levels. The project assurance role supports the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. Project Assurance has to be independent of the Project Manager; therefore, the Project Board cannot delegate any of its assurance responsibilities to the Project Manager.

160. *GCF-specific oversight and quality assurance services:* As an Accredited Entity to the GCF, UNDP is required to deliver GCF-specific oversight and quality assurance services. The GCF Board expects their accredited partners to manage recipient country projects according to the due diligence standards of the GCF, and to perform certain governance functions. The GCF is therefore not a donor to UNDP. As an accredited partner to the GCF, UNDP has agreed to serve as an 'operational arm' of the GCF and is accountable to the GCF Board. This relationship is enshrined in the Accreditation Master Agreement, the legal agreement between the GCF and UNDP.

161. GCF-specific services generally cover two main areas: first, **project cycle management services** that cover due diligence activities each funded activity (i.e. project) is expected to undertake; and second, **corporate services** that cover portfolio management, reporting, and UNDP's role in the governance of the GCF. These services are decided by the GCF Board, are specific to each project and are covered by a GCF fee.

162. The GCF Board decides the level of fee it will provide to cover the costs associated with the delivery of the GCF-specific services for each project. The GCF allocates the entire fee once the project is approved, and the fee is expected to cover the full cost of delivering the GCF-specific services for the full lifetime/duration of the project. If the project is extended beyond the original planned duration, the services must still be delivered for each additional year of implementation. If the fees have already been fully allocated, non-GCF resources must be used to deliver the services. If a project is cancelled, the fees must be returned to the Fund. The Accreditation Master Agreement states that the GCF resources can only be used for the purpose for which it was provided and cannot be diverted for other purposes. For this project the approved fee US$ 2,127,272.76 at 9%.

163. The services UNDP is required to deliver to the GCF are undertaken by different Units in UNDP as follows:

164. <u>UNDP – Global Environmental Finance Unit (Regional and HQ levels)</u>

1. Trust Fund Management: As per the requirements in the UNDP POPP and the GCF AMA and Funded Activity Agreement (FAA), the UNDP-GEF Unit undertakes trust fund management activities including:
    - Manage UNDP's relationship with the GCF;
    - Represent UNDP in the governance arrangements of the GCF (including policy development; outreach and knowledge management);
    - Receipt of contributions and allocation of trust fund resources;
    - Financial management of trust fund resources;
    - Fulfill all GCF monitoring, reporting and evaluation requirements;
    - Monitor GCF milestones and due diligence requirements.

2. Project design and development: in close consultation with governments and country offices, the UNDP-GEF Unit is responsible for preparing GCF-eligible projects that meet the technical and due diligence criteria of the GCF. The activities include:

- Prepare project concepts for review/approval by GCF;
- Screen project concepts for social and environmental risks;
- Prepare all necessary due diligence studies/assessments during project development;
- Prepare full funding proposals;
- Undertake internal technical and financial due diligence;
- Address GCF secretariat and ITAP comments to the proposals;
- Secure GCF approvals.

3. Project implementation and closure: in close consultation with the Country Office, the UNDP-GEF Unit is responsible for providing final quality assurance of all Fund-specific reports to ensure they are prepared in a timely fashion, and meet the quality standards of the Fund. This includes:
    - Quality assurance of annual work plans according to the GCF disbursement schedule;
    - Quality assurance of the GCF annual project report;
    - Participate in and support in-country GCF visits/learning mission/site visits;
    - Quality assurance of the project mid-term review and management response;
    - Quality assurance of any other GCF-required project reports;
    - Prepare and submit fund specific financial reports;
    - Quality assurance of project budget and financial transactions according to GCF policies;
    - Troubleshooting project missions as and when necessary (i.e. high risk, slow performing projects);
    - Quality assurance of terminal evaluation report and management response;
    - Return of un-spent GCF resources to the GCF.

165. UNDP Country Office**:** The UNDP Country Office will deliver GCF-specific services over the planned lifetime/duration of the project as follows:

1. Project development:
    - Coordinate and participate in GCF country driven project design consultations;
    - Support the identification and confirmation of GCF project co-financing;
    - Provide input to the GCF concept note and UNDP GCF project document.

2. Project start:
    - Ensure quick project start and first disbursement;
    - Coordinate/prepare the project inception workshop;
    - Oversee finalization of the project inception workshop report;

3. Project implementation and closure: first-tier of UNDPs three-tier quality control system
    - Coordinate/prepare annual Project Board Meetings;
    - Undertake UNDP-required project monitoring and quality assurance;
    - Issue annual work plan, strict monitoring of the implementation of the work plan and the project timetable;
    - Monitor the implementation of the project procurement plan;
    - Prepare GCF annual project report: review input provided by Project Manager/team; complete required sections;
    - Support to GCF visits/learning mission/site visits;
    - Initiate, coordinate, finalize the project mid-term review and management response;
    - Preparation of any other GCF project reports;
    - Conduct annual supervision/oversight site missions;
    - Ensure that risks are properly managed, and that the risk log in Atlas is regularly;
    - Initiate, coordinate, finalize the project terminal evaluation and management response.

166. UNDP Regional and Central Bureau: will deliver the following services

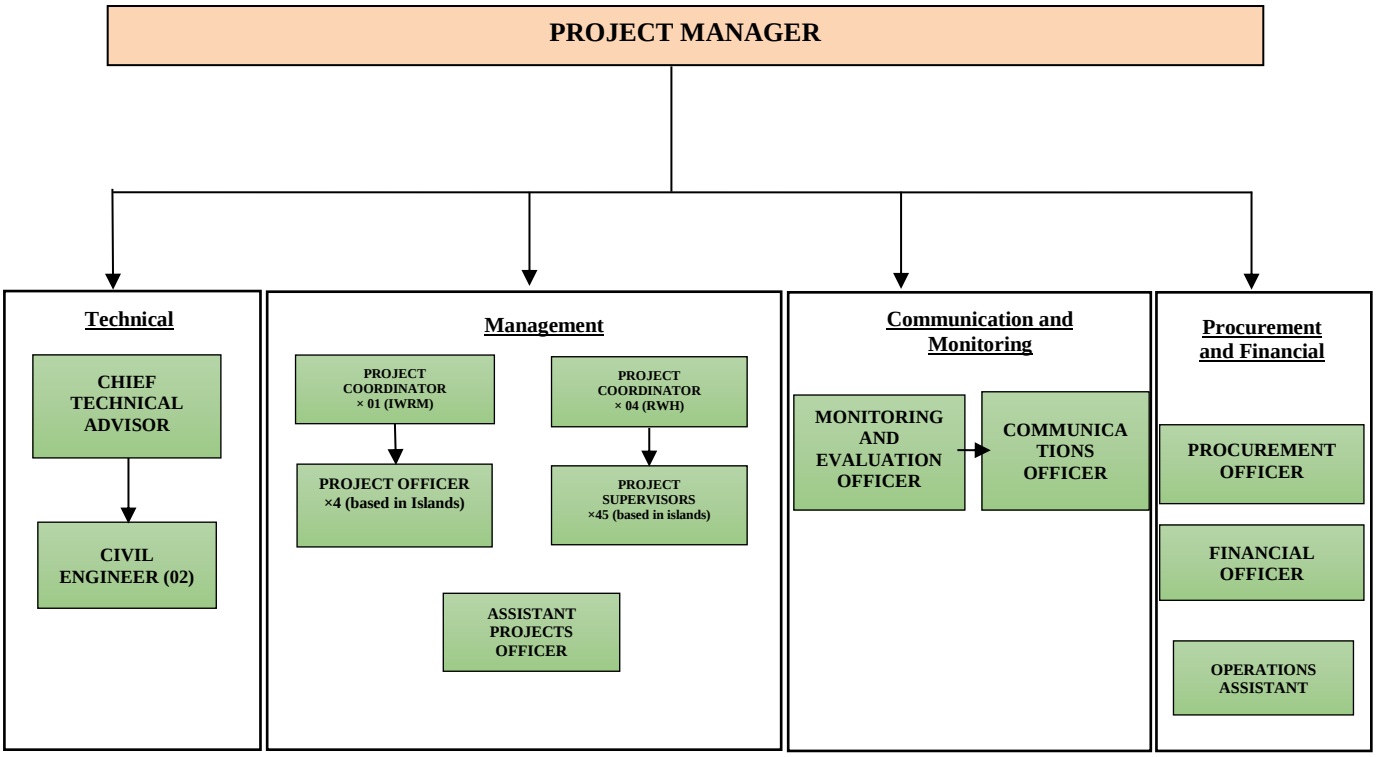
- Overall fiduciary and financial policies, accountability and oversight on all UNDP projects including those financed by the GCF;
- Treasury Functions including banking information and arrangements and cash management;
- Preparation and certification of UNDP annual financial statements and donor reports;
- Travel services, asset management, and procurement policies and support;
- Management and oversight of the audit exercise for all GCF projects;
- Information Systems and Technology provision, maintenance and support;
- Legal advice and contracting/procurement support services;
- Strategic Human Resources Management and related entitlement administration;
- Office of Audit and Investigations oversight/investigations into allegations of misconduct, corruption, wrongdoing and fraud; and social and environmental compliance unit and grievance mechanism.
- Independent Evaluation Office assessment of terminal evaluation reports; evaluation guidance and standard setting.

ii. Direct Project Services as requested by Government: services provided to government directly under NIM The UNDP Country Office will also deliver a pre-determined set of project-specific execution services at the request of the Government. To ensure the strict independence required by the GCF and in accordance with the UNDP Internal Control Framework, these execution services should be delivered independent from the GCF-specific oversight and quality assurance services (i.e. not done by same person to avoid conflict of interest).

167. These execution services will be charged to the project budget in accordance with the UNDP's Harmonized Conceptual Funding Framework and Cost Recovery Methodology. The letter of agreement for these direct project costs is included in Annex to this project document.

168. At present no specific services requested except the recruitment of a Chief Technical Advisor as a consultant and an Operations Officer under UNDP Service Contract. Procurement plan details out all procurement services to be carried out by PMU. If changes subject to second capacity assessment one year later, Government will provide request of direct project services, UNDP CO would notify UNDP-GEF RTA and proceed to sign an LOA with the IP as per UNDP policy on Direct project services.

iii. Project Management Unit:



169. The PMU will be housed within the structure of the Ministry of Environment and Energy and will comprise of staff hired on local contracts for a period of 36 months with possibility of extension.

170. Two engineers will be hired to supervise the design and provide all the technical assistance in both the components.

171. Project Officers and Project Supervisors will be hired for both the components and will be stationed at island level. In that case 45 project supervisors will be hired for Rainwater Harvesting component and 04 project officers for IWRM component who will be based in islands. During the project period, the project officers appointed for RWH component will have to report to the council on a daily basis as they will be stationed in the council to monitor and supervise the project works at island level. Later they will be appointed as council staffs to operate and maintain the system. And in the IWRM component, the project officers will continue to be utility staffs after the project period. The project officers will not be indicated as part of the PMU however there will be an organized reporting mechanism that will allow them to report to MEE. These staffs will be contracted for the project work period only.

172. Two separate staffs need to be appointed for 1) Communication and 2) Monitoring and Evaluation task, as 01 staff may not be able to perform both the functions. Particularly monitoring and evaluation specialist need to oversee the overall project performance framework and develop necessary tools to ensure smooth implementation of the project.

iv. 173. Agreement on intellectual property rights and use of logo on the project's deliverables: In order to accord proper acknowledgement to the GCF for providing grant funding, the GCF logo will appear together with the UNDP logo in addition to the government emblem, as the implementing partner of the project on all promotional materials, other written materials like publications developed by the project, and project

hardware. Any citation on publications regarding projects funded by the GCF will also accord proper acknowledgement to the GCF as per the GCF branding guidelines.

v. 174. Disclosure of information: Information will be disclosed in accordance with relevant policies notably the UNDP Disclosure Policy[36] and the GCF Disclosure Policy[37].

vi. 175. Carbon offsets or units: As outlined in the AMA agreement between UNDP and the GCF, to the extent permitted by applicable laws and regulations, the Implementing Partner will ensure that any greenhouse gas emission reductions (e.g. in emissions by sources or an enhancement of removal by sinks) achieved by this project shall not be converted into any offset credits or units generated thereby, or if so converted, will be retired without allowing any other emissions of greenhouse gases to be offset.

[36] See http://www.undp.org/content/undp/en/home/operations/transparency/information_disclosurepolicy/
[37] See https://www.greenclimate.fund/documents/20182/184476/GCF_B.12_24_-_Comprehensive_Information_Disclosure_Policy_of_the_Fund.pdf/f551e954-baa9-4e0d-bec7-352194b49bcb

VIII. MONITORING AND EVALUATION (M&E) PLAN

176. The project results as outlined in the project results framework will be monitored and reported annually and evaluated periodically during project implementation to ensure the project effectively achieves these results.

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

178. In addition to these mandatory UNDP and GCF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Workshop Report. This will include the exact role of project target groups and other stakeholders in project M&E activities including national/regional institutes assigned to undertake project monitoring.

i. M&E oversight and monitoring responsibilities:

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

180. The Project Manager will develop annual work plans to support the efficient implementation of the project. The Project Manager will ensure that the standard UNDP and GCF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for evidence-based reporting in the Annual Project Report, and that the monitoring of risks and the various plans/strategies developed to support project implementation (e.g. Environmental and social management plan, gender action plan etc..) occur on a regular basis.

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

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

183. **UNDP Country Office:** The UNDP Country Office will support the Project Manager as needed, including through annual supervision missions. The annual supervision missions will take place according to the schedule outlined in the annual work plan. Supervision mission reports will be circulated to the project team and Project Board within one month of the mission. The UNDP Country Office will initiate and organize key M&E activities including the Annual Project Report, the independent mid-term review and the independent terminal evaluation. The UNDP

Country Office will also ensure that the standard UNDP and GCF M&E requirements are fulfilled to the highest quality.

184. The UNDP Country Office is responsible for complying with all UNDP project-level M&E requirements as outlined in the UNDP POPP. This includes ensuring the UNDP Quality Assurance Assessment during implementation is undertaken annually; the regular updating of the ATLAS risk log; and, the updating of the UNDP gender marker on an annual basis based on gender mainstreaming progress reported in the Annual Project Report and the UNDP ROAR. Any quality concerns flagged during these M&E activities (e.g. Annual Project Report quality assessment ratings) must be addressed by the UNDP Country Office and the Project Manager.

185. The UNDP Country Office will support GCF staff (or their designate) during any missions undertaken in the country, and support any ad-hoc checks or ex post evaluations that may be required by the GCF.

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

187. **UNDP-Global Environmental Finance Unit (UNDP-GEF):** Additional M&E and implementation oversight, quality assurance and troubleshooting support will be provided by the UNDP-GEF Regional Technical Advisor and the UNDP-GEF Directorate as outlined in the management arrangement section above.

ii. Audit:

188. The project will be audited according to UNDP Financial Regulations and Rules and applicable audit policies on NIM implemented projects.[38] Additional audits may be undertaken at the request of the GCF. The project may also be subject to an annual audit by a Party appointed by the Implementing Partner, as required.

iii. Additional monitoring and reporting requirements:

189. **Inception Workshop and Report**: A project inception workshop will be held within 3 months from first disbursement to organize inception meeting including completing key recruitments needed (e.g. Project Manager), etc.:

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

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

[38] See guidance here: https://info.undp.org/global/popp/frm/pages/financial-management-and-execution-modalities.aspx

191. **Annual Project Report:** The Project Manager, the UNDP Country Office, and the UNDP-GEF Regional Technical Advisor will provide objective input to the annual project report covering the calendar year for each year of project implementation. The Project Manager will ensure that the indicators included in the project results framework are monitored annually in advance so that progress can be included in the report. Any environmental and social risks and related management plans will be monitored regularly, and progress will be included in the report.

192. The Annual Project Report will be shared with the Project Board. The UNDP Country Office will coordinate the input of other stakeholders to the report as appropriate. The quality rating of the previous year's report will be used to inform the preparation of the subsequent report.

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

194. **Independent Mid-term Review (MTR):** An independent mid-term review process will begin after the second Annual Project Report has been submitted to the GCF. This is expected to be *April 2019.* The MTR findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the MTR report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the UNDP Evaluation Resource Center (ERC). As noted in this guidance, the evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Other stakeholders will be involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate. The final MTR report will be available in English and will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and approved by the Project Board.

195. **Terminal Evaluation (TE):** An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terminal evaluation process will begin at least three months before operational closure of the project allowing the evaluation mission to proceed while the project team is still in place, yet ensuring the project is close enough to completion for the evaluation team to reach conclusions on key aspects such as project sustainability. This is expected to be *July 2021.*

196. The Project Manager will remain on contract until the TE report and management response have been finalized. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the UNDP Evaluation Resource Center. As noted in this guidance, the evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Additional quality assurance support is available from the UNDP-GEF Directorate. The final TE report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the Project Board. The TE report will be publicly available in English on the UNDP ERC.

197. The UNDP Country Office will include the planned project terminal evaluation in the UNDP Country Office evaluation plan, and will upload the final terminal evaluation report in English and the corresponding management response to the UNDP Evaluation Resource Centre (ERC).

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

Mandatory GCF M&E Requirements and M&E Budget:

GCF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[39] (US$)		Time frame
		GCF grant	Co-financing	
Inception Workshop	UNDP Country Office and Project Manager	USD 11,000	None	Within 3 months from first disbursement to organize inception meeting including completing key recruitments needed (e.g. Project Manager), etc.
Inception Workshop Report and baseline assessments	Project Manager	USD 15,000	None	Within six months after Effective Date.
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	None	Quarterly, annually
Monitoring of indicators in project results framework ***(including hiring of external experts, project surveys, data analysis etc.)***	Project Manager	Per year: USD 10,000	None	Annually
Annual Project Report	Project Manager and UNDP Country Office and UNDP-GEF team	None	None	Annually
NIM Audit as per UNDP audit policies	UNDP Country Office	Per year: USD5,000	None	Annually or other frequency as per UNDP Audit policies
Lessons learned, case studies, and knowledge generation	Project Manager	Per year: USD 1,000	None	Annually
Monitoring of environmental and social risks, and corresponding management plans as relevant	Project Manager UNDP CO	Per year: 1,500 USD	None	On-going
Monitoring of gender action plan	Project Manager UNDP CO	Per year: USD 4,000	None	On-going
Monitoring of stakeholder engagement plan	Project Manager UNDP CO	Per year: USD 4,000	None	On-going
Addressing environmental and social grievances	Project Manager UNDP Country Office BPPS as needed	Per year: USD 4,000	None	*Costs associated with missions, workshops, BPPS expertise etc. can*

[39] Excluding project team staff time and UNDP staff time and travel expenses.

GCF M&E requirements	Primary responsibility	Indicative costs to be charged to the Project Budget[39] (US$)		Time frame
		GCF grant	Co-financing	
				be charged to the project budget.
Project Board meetings	Project Board UNDP Country Office Project Manager	Per year: USD *1500*	None	At minimum annually
Supervision missions	UNDP Country Office	None[40]	None	Two per year
Oversight missions	UNDP-GEF team	None[41]	None	Troubleshooting as needed
GCF learning missions/site visits	UNDP Country Office and Project Manager and UNDP-GEF team	None[42]	None	To be determined.
Independent Mid-term Review (MTR) and management response	UNDP Country Office and Project team and UNDP-GEF team	USD 30,000	None	Once after the submission of the second Annual Progress Report
Independent Terminal Evaluation (TE) included in UNDP evaluation plan, and management response	UNDP Country Office and Project team and UNDP-GEF team	USD 60,000	None	At least three months before operational closure
Translation of MTR and TE reports into English	UNDP Country Office	USD 10,000	None	As required. GCF will only accept reports in English.
TOTAL indicative COST Excluding project team staff time, and UNDP staff and travel expenses		*USD281,000*		

[40] The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GCF Agency Fee.
[41] The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GCF Agency Fee.
[42] The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GCF Agency Fee.

IX. FINANCIAL PLANNING AND MANAGEMENT

199. The total cost of the project is *USD 28,229,364.* This is financed through a GCF grant of *USD 23,636,364*, *USD 100,000* in cash co-financing to be administered by UNDP and *USD 4,493,000* in parallel co-financing. UNDP, as the GCF Accredited Agency, is responsible for the oversight and quality assurance of the execution of GCF resources and the cash co-financing transferred to UNDP bank account only.

i. Project Financing

Table 7: Summary of project financing

Component	Outputs	Financing institution			Total (US$)
		GCF	Government	UNDP	
		Grant	Grant	Grant	
Component 1. Climate resilient water supply system for population of outer islands of Maldives	Scaling up integrated water supply system to provide safe water to vulnerable households (at least 32,000 people, including 15,000 women)	18,317,304	4,193,000	-	25,769,304
	Decentralized and cost-effective dry season water supply system introduced benefiting 73,000 people across the 7 northern atolls	901,000			
	Groundwater quality improved to secure freshwater reserves for long term resilience on 49 islands	2,358,000			
	Project Management	2,060,060	300,000	100,000	2,460,060
Total		**23,636,364**	**4,493,000**	**100,000**	**28,229,364**

ii. GCF Disbursement schedule

200. GCF grant funds will be disbursed according to the GCF disbursement schedule. The Country Office will submit an annual work plan to the UNDP-GEF Unit and comply with the GCF milestones in order for the next tranche of project funds to be released. All efforts must be made to achieve 80% delivery annually.

Disbursements	GCF Proceeds (USD)
Disbursement 1	3,034,330
Disbursement 2	12,112,446
Disbursement 3	6,038,072
Disbursement 4	2,022,296
Disbursement 5	429,220
Total	23,636,364

iii. Budget Revision and Tolerance:

201. GCF requirement (refer to signed FAA): (1) Any reallocation among the project outputs described in Part A of Schedule 2 resulting in a variation of more than ten per cent (10%) of the previously agreed Budget of that output must be approved in writing by GCF in advance. (2) Any change in the total projected cost for project management as specified in the Budget must be approved by GCF in advance. (3) Any budget reallocation involving a major change in the project's scope, structure, design or objectives or any other change that substantially alters the purpose or benefit of the project requires the GCF's prior written consent.

202. UNDP requirement: As outlined in the UNDP POPP, the project board will agree on a budget tolerance level for each plan under the overall annual work plan allowing the project manager to expend up to the tolerance level beyond the approved project budget amount for the year without requiring a revision from the Project Board (within the GCF requirements noted above). Should such deviation occur, the Project Manager and UNDP Country office will seek the approval of the UNDP-GEF team.

203. Any over expenditure incurred beyond the available GCF grant amount will be absorbed by non-GCF resources (e.g. UNDP TRAC or cash co-financing).

iv. Refund to GCF:

204. Unspent GCF resources must be returned to the GCF. Should a refund of unspent funds to the GCF be necessary, this will be managed directly by the UNDP-GEF Unit in New York.

v. Project Closure:

205. Project closure will be conducted as per UNDP requirements outlined in the UNDP POPP.[43] On an exceptional basis only, a no-cost extension beyond the initial duration of the project will be sought from in-country UNDP colleagues and then the UNDP-GEF Executive Coordinator.

vi. Operational completion:

206. The project will be operationally completed when the last UNDP-financed inputs have been provided and the related activities have been completed. This includes the final clearance of the Terminal Evaluation Report (that will be available in English) and the corresponding management response, and the end-of-project review Project Board meeting. The Implementing Partner through a Project Board decision will notify the UNDP Country Office when operational closure has been completed.

207. UNDP and the Implementing Partner agree that any durable assets or equipment purchased during the implementation of the project (such as vehicles or office equipment) will upon operational completion of the project be transferred to the Implementing Partner. Any funds or proceeds received from the sale of such assets will be transferred to the GCF.

i. Financial completion:

208. The project will be financially closed when the following conditions have been met: a) The project is operationally completed or has been cancelled; b) The Implementing Partner has reported all financial transactions to UNDP; c) UNDP has closed the accounts for the project; d) UNDP and the Implementing Partner have certified a final Combined Delivery Report (which serves as final budget revision).

209. The project is required to be financially completed within 12 months of operational closure or after the date of cancellation. Between operational and financial closure, the implementing partner will identify and settle all financial obligations and prepare a final expenditure report. The UNDP Country Office will send the final signed

[43] see https://info.undp.org/global/popp/ppm/Pages/Closing-a-Project.aspx

closure documents including confirmation of final cumulative expenditure and unspent balance to the UNDP-GEF Unit for confirmation before the project will be financially closed in Atlas by the UNDP Country Office.

X. TOTAL BUDGET AND WORK PLAN

TOTAL BUDGET AND WORK PLAN			
Atlas[44] Proposal or Award ID:	00094293	Atlas Primary Output Project ID:	00098433
Atlas Proposal or Award Title:	Supporting vulnerable communities in Maldives to manage climate change-induced water shortages		
Atlas Business Unit	MDV10		
Atlas Primary Output Project Title	Supporting vulnerable communities in Maldives to manage climate change-induced water shortages		
UNDP-GEF PIMS No.	5705		
Implementing Partner	Ministry of Environment and Energy of Maldives (MEE)		

GCF Output/Atlas Output	Responsible Party/[45] (Atlas Implementing Agent)	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
OUTPUT 1: Scaling up integrated water supply system to provide safe water to vulnerable households (at least 32,000 people, including 15,000 women)	**MEE**	**66000**	**GCF**	71200	International Consultants	86,083.83	108,111.83	87,111.83	66,086	-	347,393.49	A
				71300	Local Consultants	-	62,000	6,000	6,000	6,000	80,000	B
				72100	Contractual Services-Companies	2,052,049	9,414,061	4,565,061	1,445,325	-	17,476,496	C
				71600	Travel	16,467	38,623	28,623	26,467	20,000	130,180	D
				72800	Information Technology Equipment	3,043	4,057	4,057	3,043	-	14,200	E
				73100	Rental & Maintenance-Premises	40,655	54,207	54,207	40,655	-	189,724	F
				74200	Audio Visual & Print Prod Costs	-	11,804	-	-	-	11,804	G
				75700	Training, Workshops and Conference	5,250	18,750	13,500	13,500	13,500	64,500	H
				74500	Miscellaneous Expenses	1,002.17	1,002.17	1,002.17	-	-	3,006.51	I
					sub-total GCF	**2,204,550**	**9,712,616**	**4,759,562**	**1,601,076**	**39,500**	**18,317,304**	
					Total Output 1	**2,204,550**	**9,712,616**	**4,759,562**	**1,601,076**	**39,500**	**18,317,304**	

[44] See separate guidance on how to enter the TBWP into Atlas

[45] Only the responsible parties to be created as Atlas Implementing Agent as part of the COAs should be entered here. Sub-level responsible parties reporting directly to NIM Implementing Partners should not entered here. For example, if under NIM, UNOPS signs LOA with the IP to manage component 2, and a department of Ministry X will manage component 3, this means that UNOPS will be listed as the responsible party under component 2. The rest of the components will list the IP as the responsible party.

GCF Output/Atlas Output	Responsible Party/[45] (Atlas Implementing Agent)	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
OUTPUT 2: Decentralized and cost-effective dry season water supply system introduced benefiting 73,000 people across the 7 northern atolls	**MEE**	**66000**	**GCF**	71200	International Consultants	36,000	10,000	-	-	-	46,000	J
				71300	Local Consultants	20,000	20,000	-	-	-	40,000	K
				72100	Contractual services – Companies	5,000	676,250	36,250	7,500	-	725,000	L
				71600	Travel	25,000	35,000	10,000	-	-	70,000	M
				74200	Audio Visual & Print Prod Costs	10,000	10,000	-	-	-	20,000	N
					sub-total GCF	**96,000**	**751,250**	**46,250**	**7,500**	**-**	**901,000**	
					Total Output 2	**96,000**	**751,250**	**46,250**	**7,500**	**-**	**901,000**	
OUTPUT 3: Groundwater quality improved to secure freshwater reserves for long term resilience on 49 islands	**MEE**	**66000**	**GCF**	72100	Contractual services - Companies	289,600	1,094,400	726,000	32,000	2,000	2,144,000	O
				71600	Travel	-	42,500	42,500	42,500	32,500	160,000	P
				75700	Training, Workshops and Conference	-	8,000	8,000	19,000	19,000	54,000	Q
					sub-total GCF	**289,600**	**1,144,900**	**776,500**	**93,500**	**53,500**	**2,358,000**	
					Total Output 3	**289,600**	**1,144,900**	**776,500**	**93,500**	**53,500**	**2,358,000**	
PROJECT MANAGEMENT UNIT[46]	**MEE**	**66000**	**GCF**	71200	International Consultants	-	15,000	25,000	15,000	15,000	70,000	R
				71300	Local Consultants		2,000	8,000	2,000	8,000	20,000	S
				71400	Contractual Services - Individual	442,988.58	442,988.58	369,068.58	224,528.59	224,528.59	1,704,102.92	T
				72100	Contractual Services-Companies	-	15,000	25,000	15,000	25,000	80,000	U
				71600	Travel	-	22,500	22,500	22,500	22,500	90,000	V

[46] PMU costs will be used for the following activities: Full time or part time project manager (and or coordinator); Full time or part time project administrative/finance assistant; Travel cost of the PMU project staff; Other General Operating Expenses such as rent, computer, equipment, supplies, etc. to support the PMU; UNDP Direct Project Costs if requested by Government Implementing Partner; Any other projected PMU cost as appropriate. Audit should be funded under Outcome 4 on KM and M&E or under project outcomes.

GCF Output/Atlas Output	Responsible Party/[45] (Atlas Implementing Agent)	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	See Budget Note:
				74200	Audio Visual & Print Prod Costs	-	-	-	35,000	35,000	70,000	W
				75700	Training, Workshops and Conference	-	5,000	5,000	5,000	5,000	20,000	X
				74500	Miscellaneous expenses	1,191.42	1,191.42	1,191.42	1,191.41	1,191.41	5,957.08	Y
					sub-total GCF	**444,180**	**503,680**	**455,760**	**320,220**	**336,220**	**2,060,060**	
		4000	**UNDP**	71400	Contractual Services - Individual	20,000	20,000	20,000	20,000	20,000	100,000	Z
					sub-total UNDP	**20,000**	**20,000**	**20,000**	**20,000**	**20,000**	**100,000**	
					Total Management	**464,180**	**523,680**	**475,760**	**340,220**	**356,220**	**2,160,060**	
					TOTAL GCF	3,034,330	12,112,446	6,038,072	2,022,296	429,220	23,636,364	
					TOTAL UNDP	20,000	20,000	20,000	20,000	20,000	100,000	
					PROJECT TOTAL	$ 3,054,330	$ 12,132,446	$ 6,058,072	$ 2,042,296	$ 449,220	$ 23,736,364	

Summary of Funds:
[47]

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Amount Year 6-10	Total
GCF	$ 3,034,330	$ 12,112,446	$ 6,038,072	$ 2,022,296	$ 429,220		$ 23,636,364
UNDP	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000		$ 100,000
Government of Maldives	$ 479,300	$ 479,300	$ 479,300	$ 479,300	$ 479,300	$ 2,096,500	$ 4,493,000
TOTAL	$ 3,533,630	$ 12,611,746	$ 6,537,372	$ 2,521,596	$ 928,520	$ 2,096,500	$ 28,229,364

[47] Summary table should include all financing of all kinds: GCF financing, cofinancing, cash, in-kind, etc... and must match the total project financing table in the GCF term sheet

Budget notes:

Note	Description of cost item
A	Contribution to International CTA for design and supervision of 4 RO desalination water plants in 4 islands installed and made operational, using a grid-tied and / or off grid solar PV technology to provide backup capacity in times of water stress; Review and modify the design of the AF and USAID investments to adjust to target island specific conditions and water production requirements; Individual consultant to provide technical oversight for development of tariff setting guidelines (3 months at $700 per day)
B	Local consultant to design SOP for users and suppliers: 4 months @ $200 per day; Local consultant to develop and conduct training programmes in IWRM, planning, budgeting, expenditure and performance monitoring for relevant atoll and island councils and Ministries (6 months at $200 per day); Local consultant to undertake curricular design and implement professional training and mentoring for trainers including certification, budgeting and approval of new courses (8 months at $200 per day);
C	Contractual expenses for construction of rainwater harvesting systems on 45 islands including engineering and civil works, supply of tanks, filters, pumps and pipes; Contractual expenses for design ($50,000 for each island) and construction of 4 RO desalination water plants after review and modify the design of the AF and USAID investments to adjust to target island specific conditions and water production requirements including EIAs for 4 islands ($10,000 for each island); Contractual expenses for design and construction of groundwater recharge system installed for greywater recycling and excess rainwater from RWH collection systems including Groundwater studies for each island ($10,000 for each island); Firm to undertake tariff evaluation criteria and tariff setting based on household survey (5 months at $200 per day).
D	Field travel costs
E	Communication and IT service costs for the project duration as well as IT and communication consumables
F	Field office premises and accommodation for project staff
G	Expenses towards audio visual and printing production general costs, printing of SOP approval procedures undertaken at the relevant government organisations, for trainings and workshops held in the process of developing tariff evaluation criteria and tariff setting guidelines, for training programmes in IWRM, planning, budgeting, expenditure and performance monitoring for relevant atoll and island councils and Ministries and for curricular design and implementation of professional training and mentoring for trainers including certification, budgeting and approval of new courses
H	Workshop costs associated with series of sensitization and training workshops organized combined with site-based demonstrations, including refresher workshops: 8 workshops over Y2, Y3, Y4 and Y5; Hosting expenses towards consumables and facilities during trainings and workshops held in the process of developing tariff evaluation criteria and tariff setting guidelines (3 workshops); Venue costs during training programmes in IWRM, planning, budgeting, expenditure and performance monitoring for relevant atoll and island councils and Ministries (5 trainings); Training and hosting expenses during curricular design and implementation of professional training and mentoring for trainers including certification, budgeting and approval of new courses (8 workshops)
I	Project services (account code 74596) with total budget of $3,006.51 allocated for the recruitment of a Chief Technical Advisor.

Note	Description of cost item
J	Consultancy fees to undertake legislation reviews to identify critical functional gaps and functional overlaps to optimise dry season water distribution operations, establishment of institutional coordination and accountability mechanisms between the utilities, the NDMC, MEE and LGA/ councils to facilitate cost-effective and timely water supply during dry season (contribution to CTA); International consultant to undertake atoll level estimations to design water collection and distribution schemes during the dry season at the atoll level (2 months at $650 per day);
K	Local consultant to support work of international consultant to undertake atoll level estimations to design water collection and distribution schemes during the dry season at the atoll level, to undertake legislation reviews to identify critical functional gaps and functional overlaps to optimize dry season water distribution operation; Local consultancy to undertake procedural review and consultations for long term agreements for wholesale services for dry season water distribution (3 months at $200 per day)
L	Contractual services to undertake atoll level estimations to design water collection and distribution schemes during the dry season at regional level (4 hubs) and improve/add required equipment; Procurement of early warning gauges to improve coverage for rainfall observation network (4 pieces of equipment at $160,000 each); Contractual services for Development and implementation of behavior change campaign on early warning response and preparedness for water shortages
M	Travel and logistics expenses for local consultancy to undertake procedural review and consultations for long term agreements for wholesale services for dry season water distribution and for development and implementation of behavior change campaign on early warning response and preparedness for water shortages;
N	Audio visual and printing costs incurred during atoll level estimations to design water collection and distribution schemes during the dry season at the atoll level
O	Contractual services associated with establishing Groundwater monitoring protocols; Contractual services associated providing equipment and training related to established Groundwater monitoring protocols; Contractual services associated with Regulatory framework established for coastal land use, including zoning to protect coastal catchment areas and enable natural recharge of groundwater lenses; Contractual services associated with Implementation and construction of groundwater recharge mechanisms on project islands based on studies and designs; Review land use policies and formulate regulatory framework for land use to protect groundwater catchment areas
P	Travel and logistics to monitor and evaluate groundwater recharge rates and water quality change
Q	Workshop hosting expenses for establishment of regulatory framework for coastal land use, including zoning to protect coastal catchment areas and enable natural recharge of groundwater lenses and for implementation and construction of groundwater recharge mechanisms on project islands
R	International Consultants (including CTA contributions from PMU) for Monitoring and Evaluation and Technical quality assurance and supervision
S	Local consultancy fees supporting monitoring and evaluation
T	PMU Staffing costs (Project Manager, Monitoring and Evaluation Officer, Communications Officer, Procurement Officer, Finance Officer, Operations Officer); Consultancy fees for independent mid-term review ($30,000); Consultancy fees for independent terminal evaluation ($60,000); NIM Audits as per UNDP audit policies ($5,000 per year)
U	Contractual costs associated with setting up PMU office space and maintenance.
V	Travel and logistics costs associated with PMU travel for monitoring and QA purposes

Note	Description of cost item
W	PMU audio visual and print production costs associated with meetings and events organized by PMU, General day to day office usage also included.
X	Workshop costs associated with inception workshop, hosting costs for training, workshops, board meetings, meetings organized by the PMU
Y	Project services (account code 74596) with total budget of $5,957.08 allocated for the recruitment of an Administration and Finance Assistant, and processing of FACE forms.
Z	PMU staff costs supporting M&E and supervision

XI. LEGAL CONTEXT

i. Additional legal conditions

210. Any designations on maps or other references employed in this project document do not imply the expression of any opinion whatsoever on the part of UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

211. By signing this UNDP GCF project document, the Implementing Partner also agrees to the terms and conditions of the GCF Funded Activity Agreement (FAA) included in Annex and to use the GCF funds for the purposes for which they were provided. UNDP has the right to terminate this project should the Implementing Partner breach the terms of the GCF FFA.

ii. Legal Context Standard Clauses

212. This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of Maldives and UNDP, signed on 15 July 1977. All references in the SBAA to "Executing Agency" shall be deemed to refer to "Implementing Partner."

iii. Risk Management Standard Clauses

1. 213. Consistent with the Article III of the SBAA *[or the Supplemental Provisions]*, the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner. To this end, the Implementing Partner shall:
   a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
   b) assume all risks and liabilities related to the Implementing Partner's security, and the full implementation of the security plan.

2. 214. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the Implementing Partner's obligations under this Project Document.

3. 215. The Implementing Partner agrees to undertake all reasonable efforts to ensure that no UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be

accessed via http://www.un.org/sc/committees/1267/aq_sanctions_list.shtml. This provision must be included in all sub-contracts or sub-agreements entered into under/further to this Project Document.

4. 216. Consistent with UNDP's Programme and Operations Policies and Procedures, social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (http://www.undp.org/ses) and related Accountability Mechanism (http://www.undp.org/secu-srm).

5. 217. The Implementing Partner shall: (a) conduct project and programme-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the project or programme to comply with such standards, and (c) engage in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.

6. 218. All signatories to the Project Document shall cooperate in good faith with any exercise to evaluate any programme or project-related commitments or compliance with the UNDP Social and Environmental Standards. This includes providing access to project sites, relevant personnel, information, and documentation.

XII. MANDATORY ANNEXES

The following documents are mandatory annexes and must be included as part of the final project document package. These documents must be posted to open.undp.org, and can also be posted to the UNDP County Office website as appropriate.

A. Gender assessment, action plan and budget
B. Offline UNDP Risk log
C. Environment and social impact assessment
D. Social and environmental risk screening checklist
E. Risk assessment and proposed mitigation measures
F. Monitoring and evaluation plans
G. Activities and inputs at project/programme level
H. GCF Funding Activity Agreement
I. GCF Notice of FAA effectiveness and term sheet
J. Direct project cost Letter of Agreement
K. Letters of co-financing
L. Environment and social management plan
M. Map of project locations with GPS coordinates
N. Timetable of project implementation
O. Procurement plan
P. Terms of Reference for key staff
Q. UNDP project quality assurance report
R. Results of the capacity assessment of the project implementing partner