



United Nations Development Programme

Country: Maldives

Project Document

Project Title: Present cost-effective, locally appropriate coastal management and drainage management options contributing to climate change resilience of communities in Fares-Maathoda

UNDAF Outcome(s): Outcome 9: Enhanced capacities at national and local levels to support low carbon lifestyles, climate change adaptation, and disaster risk reduction

Expected CP Outcome(s): 9.3 Community preparedness and resilience for disaster and climate change impacts enhanced
(Those linked to the project and extracted from the CPAP)

Expected Output(s): 9.3.1 Analyze and demonstrate adaptation options on coastal protection measures and draw policy linkages
(Those that will result from the project and extracted from the CPAP)

Implementing Partner: UNDP Maldives

Executing Partner: UNOPS

| | |
|--------------------------|------------------|
| Programme Period: | <u>2011-2015</u> |
| Atlas Award ID: | |
| Start date: | <u>Dec 2010</u> |
| End Date : | <u>Aug 2011</u> |
| PAC Meeting Date: | |
| Management Arrangements: | <u>DIM</u> |

| | |
|---------------------------|--|
| 2011 AWP budget: | <u>DKK</u> |
| Total resources required: | <u>5,000,000.00</u> <i>(USD881,600) As per exchange rate at the time of signing</i> |
| Regular: | |
| Other: | |
| Government of Denmark | <u>5,000,000.00</u> |
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Agreed by Implementing Partner (UNDP):

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Brief Description

The small, low-lying atoll islands of Maldives are highly vulnerable to flooding and coastal erosion. More than 44% of settlements, including 42% of the population, and more than 70% of all critical infrastructure are located within 100 meters of shoreline. Intensive rainfall, storm surges and swell waves are expected to be aggravated through sea level rise and climate change effects on weather patterns. This will compound underlying trends of increasing coastal erosion and pressure on scarce land resources, and increase physical vulnerability of island populations, infrastructure and livelihood assets. Climate change risks and long-term resilience are not adequately integrated into island land use planning, or into coastal development and protection policies and practice, and past autonomous risk reduction efforts have sometimes had mal-adaptive effects.

Government of Maldives and UNDP, with the Least Developed Countries Fund (LDCF) assistance through Global Environment Facility (GEF), is implementing a project titled “Integrating Climate Change Risks into Resilience Islands Planning” (ICCR) to systematically assess the costs and benefits of different adaptation options in the fields of land use planning and coastal protection, and to develop the necessary institutional and individual capacity at national, provincial, atoll and island levels to enable decentralized and well-informed decision-making. In order to strengthen the enabling environment for decentralized adaptation planning, climate risk reduction measures will be anchored in key environmental, land use, decentralization, privatization and disaster risk reduction policies. One of the pillars of the ICCR Project is to demonstrate practical, locally prioritised adaptation options for flooding and erosion control on at least four islands in four different atolls. The knowledge from these will be systematically analysed and fed into policy and planning processes, as well as disseminated nationally and internationally.

This project proposes to expand the ICCR component to an additional site: the island of FaresMaathoda in Gaafu Dhaalu Atoll. Coastal Management options will be demonstrated at the island in order to minimise impacts from the strong waves coming in from the ocean side, especially to minimise impacts from episodic storm events. Drainage management options will be put in place to minimise the flooding of the island during rainy season, especially given the changes in the rainfall pattern that is now observed and are predicted with climate change.

In order to strengthen the community resilience, increasing the capacities of the civil society is extremely important especially given that efforts on decentralised governance are underway. The UNDP Maldives hosts the GEF Small Grants Programme (SGP) for the Maldives which has received numerous proposals from the communities to address environmental issues such as waste management, coastal/erosion management, water management etc. Using the SGP mechanism, this project will support more than 10 community/NGO proposals through the existing SGP.

Waste Management is a serious issue facing almost all inhabited islands, and Fares-Maathodaa is no exception. “Soft” interventions largely focusing on community awareness and involvement in waste management will be conducted under this project on the island targeted towards addressing this issue.

It should be noted that the project intervention while attempts to address drainage issues, it does not intended to address ground water recharge and water resource management. Additionally the project would not be able to provide complete coastal management options, instead it will support setting up no-regrets coastal interventions with regards to the community and government plans for the selected site.

This project will also support the development of a larger comprehensive programme, scaling up the pilots and best practices that contribute to “low emission climate resilient development”

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1. SITUATION ANALYSIS

1.1. Climate Change-induced problem

The Republic of Maldives is an archipelago of 26 natural atolls and some 1,190 small, low-lying, coral islands distributed along an 860 km long chain, running north to south, in the Indian Ocean. The country has a combined land and sea area of 115,300 km² and an Exclusive Economic Zone of 859,000 km² (MPND 2008). The Maldivian atolls are the seventh largest reef system in the world and the largest in the Indian Ocean, with a total reef area of over 21,000 km². Administratively, the country is divided into 20 atolls, 194 'inhabited' islands¹ and the capital Malé. The total population in 2008 was estimated at 309,575 (MPND 2008). Over a third of the population lives in Malé.

The Maldives has a tropical monsoon climate, dominated by two monsoon periods: the northeast monsoon from December to April and the southwest monsoon from May to November. The southwest monsoon is the wetter of the two monsoons and is typically the period when most severe weather events occur. Average annual rainfall is 2,124 mm, but with a rainfall gradient that varies from 1,786 mm in the north to 2,277 mm south. Daily temperature varies between 23°C and 31°C, with a mean daily minimum temperature of 25.7°C, and a mean daily maximum temperature of 30.4°C. Humidity ranges between 73% and 85% (MEEW 2007).

The major climate hazards to which the Maldives is exposed regularly include windstorms, heavy rainfall, drought, sea swells, storm surges and *udha*². Of these, the most serious are considered to be swell waves, heavy rainfall and windstorms, because of their high frequency and great potential for causing damage through flooding, erosion and other impacts. The combined effect of storm surges and tides, or storm tides, can be especially destructive. However, there is considerable variation in hazard patterns across the archipelago and even between islands in the same atoll, due to local variation in geophysical and climatic factors (MHAHE 2001; MEEW 2007; UNDP 2006 & 2007). For example, the northern atolls face a greater risk of cyclonic winds and storm surges than the southern atolls, where the risk is much lower because of proximity to the equator (UNDP 2006; see Annex 3 for a more detailed analysis of climate risks to the Maldives).

Current and future climate-related risks to the Maldives and key areas of vulnerability have been analyzed in the country's First National Communications (FNC, MHAHE 2001³) to the United Nations Framework Convention on Climate Change (UNFCCC) and the National Adaptation Programme of Action (MEEW 2007). Climate risks are also considered to some extent in recent assessments of disaster risks, poverty and vulnerability (MPND 2004, UNDP 2006, UNDP 2007, 2008 & 2009). Climate change is expected to increase the frequency and intensity of existing climate hazards and lead to long-term sea level rise (SLR) and increased sea surface temperatures (SST), with grave implications for the country's continued development. While there is some evidence that coral reefs will grow upwards along with SLR, it is unclear whether they will be able to keep pace with higher rates of SLR, which are projected to rise by 5 mm/year on average, with a range of 2-9 mm/year (IPCC 2001). The reefs are also threatened by climate-change related increases in SST and concentrations of oceanic CO₂, which will further impair their ability to keep pace with SLR.

¹ An 'inhabited' island in the Maldives refers to an administrative category and does not necessarily correspond to a geographic island. For example, one 'inhabited island' may include two or more geographic islands, while one geographic island may constitute more than one 'inhabited' island. However, inhabited islands are where the main population lives and distinguished from islands used for tourism and other purposes, of which there are a further 168. The capital Malé is always treated separately and references to 'the islands' or 'the atolls' generally means outside Malé.

² *Udha* refers to the annual rise in the water surface on the coast during the Southwest monsoon which causes limited coastal flooding with a water depth of less than 0.6 m. *Udhas* are unique to the Maldives, but precisely how they originate remains unclear (Shaig 2006a; UNDP 2007).

³ The Initial National Communications to the UNFCCC is published officially as the First National Communications of the Republic of Maldives.

The low-lying coral islands of the Maldives are especially vulnerable to both rainfall and ocean-induced flooding, due to both short-term changes in sea level such as storm surges and swell waves, as well as the long term SLR projected by IPCC scenarios: 96% of islands are less than 1 km² and average altitude is only 1.5 m. Flooding can have very serious consequences as more than 44% of settlements, including 42% of the population, and more than 70% of all critical infrastructure are within 100m of the shoreline. Given the small size of most islands and the scarcity of land, setbacks are either not feasible or offer limited protection. Between 2000-2006, 45% of all inhabited islands were flooded at least once, with 19% of islands inundated regularly, or at least once a year. During the severe weather event of May 2004, at least 36% of inhabited islands were flooded. Significant investments have been made to develop the infrastructure of the Maldives, which includes several airports, commercial ports and numerous island harbours and piers, which are now threatened by climate change impacts. A flooding event in 1987 caused damages worth US\$4.5 million to Malé International Airport alone (MHAHE 2001). Coastal access infrastructure is currently valued at US\$200 million (Shaig 2006a).

Climate change is also likely to aggravate underlying coastal erosion problems, which are already damaging economic assets, exacerbating pressure on scarce land and beach resources, and increasing the vulnerability of island populations and settlements to strong winds, high waves, and flooding. Land is one of the scarcest resources in the Maldives, with recent estimates suggesting a total land area of just 235 km² for the entire country, or 1% of its total reef area. Beaches, which are extremely dynamic in the Maldives, covered an estimated total area of 11-13 km² in 2006, spread along some 2,000 km of coastline. In 2004, 97% of inhabited islands experienced coastal erosion, and 64% experienced severe erosion (Shaig 2006a). By 2009, this had increased to 85% of 194 inhabited islands reporting severe erosion (EPA data in DNP 2009). The implications of accelerated coastal erosion due to climate change is of particular concern given the limited beach and land area of the Maldives and the economic importance of beaches in an island nation with an economy driven by tourism and fishing.

The impact of the December 2004 Asian tsunami on the Maldives underscores the country's extreme vulnerability to natural hazards, and provides a good indication of the possible impacts of future climate change-induced natural disasters. The tsunami caused severe damage to physical infrastructure in many islands, setting back the high levels of economic progress and prosperity achieved by the country over recent years. Total damages were estimated at US\$470 million or some 62% of GDP, including direct losses estimated at US\$298 million (World Bank/ADB/UN 2005).

1.2. Root causes of physical vulnerability to climate risks

Inherent Physical Vulnerability and Natural Island Resilience

The Maldives is inherently vulnerable to climate and other natural hazards due to its geographic and geophysical characteristics including the small size, low elevation, narrow width and unconsolidated nature of its coral islands (Section 1.1). Historically, the islands have exhibited considerable natural resilience to fluctuating sea levels, varying climatic conditions, wave action, extreme weather events and other major hazard events. The coral reefs, in particular, play an important role in protecting the islands from the impacts of extreme weather events, along with coastal sand ridges, natural vegetation and other natural features. The economic and biological values of the reefs have long been recognized. Additionally, the natural protective functions of the reefs as the country's first line of defence against a range of natural hazards including climate risks became more widely understood during the 2004 Indian Ocean tsunami, the impacts of which would have been far greater without the buffering role of the reefs and other natural features.

The Government of Maldives (GOM) has adopted several measures to protect the country's coral reefs, including a ban on coral mining, environmental safeguards on tourism development and,

more recently, the establishment of marine protected areas.⁴ There continues to be some local anthropogenic pressure on the reefs, which the government continues to try to address. However, the single largest source of coral destruction in recent history, particularly of soft corals, was due to the El Nino-related bleaching event of 1998, and the biggest threat to the country's coral reefs are climate-change induced impacts (Section 1.1).

Threats arising from current land use, coastal protection and development planning and practice

A major cause of increasing physical vulnerability to climate risks in the Maldives is that these are not taken into account systematically and comprehensively in the development planning process, particularly in the areas of land use, coastal protection and development. Consequently, natural island resilience and local adaptive capacity are being reduced unintentionally in many inhabited islands. Many houses and considerable critical infrastructure are at risk due to their design or their siting; natural island resilience is being lost as sand ridges are levelled during land reclamation or mined for sand; coastal vegetation and inland wetlands are being converted to other forms of land use; island drainage systems are not being designed to withstand future heavier rainfall. Major physical modifications to islands that result from land reclamation, harbour and road construction are often especially damaging to natural island resilience, as these usually alter island topography and the patterns of coastal erosion and accretion. In many islands across the Maldives, such interventions have either created fresh problems of flooding and erosion or exacerbated existing ones (MFF 2009; Shaig 2006a & b). Most methods of controlling erosion and flooding rely on coastal engineering and hard physical structures such as sea walls and groynes, which are very expensive and therefore difficult to maintain or replicate widely. For example, the total cost of building a 4.35 km sea wall around Malé was \$54 million, or \$12.4 million/km of wall (A. Shaig pers. comm.; MHT 2009) Other measures while solving the initial problem, may create other problems: for example, beach nourishment to combat erosion involves extracting sand from internal island lagoons and can extremely environmentally damaging if the sand is dredged rather than pumped from the lagoons.

There is now greater understanding of how land use planning and coastal development can adversely impact islands and increase vulnerability to climate and other natural hazards, especially flooding and erosion. However, there are still a number of constraints to modifying existing approaches to land use planning, coastal protection and development in the Maldives, due to gaps in the policy framework, weak intersectoral coordination, limited institutional and individual capacity for climate risk management and adaptation planning, including gaps in technical knowledge and know-how as well as major financial constraints.

1.3. Fresh Water Resources

The Republic of Maldives, geographically is an archipelago small, low-lying, coral islands and therefore the only conventional water resources available on islands in Maldives are confined shallow groundwater aquifers, rainwater and small brackish/salt/fresh water ponds on some islands, hence the Maldivian Islands are highly prone to experience problems with access to safe drinking water in an environment with a changing climate. Many freshwater aquifers of the islands are already stressed from over-extraction and face the risk of total depletion. This already precarious hydrological system is further aggravated by climate change-induced effects of sea level rise and flooding during extreme weather events, which increases saltwater intrusion into the freshwater lens. Salinization of groundwater is affecting the quality of life in the islands, as people depend on groundwater for washing, bathing and other non-potable uses. Saltwater intrusion is also affecting soil and vegetation, causing impacts on agriculture and terrestrial ecosystems.

⁴ The GOM/GEF/UNDP supported Atoll Ecosystem Conservation (AEC) Project in Baa Atoll has contributed to the expansion of the country's marine protected areas network and is generally strengthening biodiversity conservation efforts in the Maldives (see Section 2.3).

1.4. Waste Management

Maldives in recent years has faced a significant increase in the magnitude of solid waste management problems for a number of reasons, including, but not necessarily limited to: the small size of the islands; the rapid growth in population; changing consumption patterns; transportation difficulties and costs. The worsening waste management situation is increasingly resulting in pollution of the environment, and the generation of conditions prejudicial to public health. Some of the key problems preventing sustainable improvements in solid waste management are: insufficient funding of infrastructure; absence of appropriate cost recovery mechanisms; inadequate institutional capacity; weak legislative and regulatory framework and limited capacities for involvement of private sector in service delivery. Another very key element is the weak public knowledge on good practices of waste management including waste minimisation, collection, disposal, and where possible waste utilisation. Improper waste dumping and disposal are causing irreparable damage to the fragile marine ecosystems: the first line of coastal defence. Disposed waste on the shore gets washed in-land with the waves and floods and contribute to disease outbreaks.

The Government, under the privatisation policies, has instructed regional utility companies to undertake waste management at the regional and island level. The Government has also formed the Waste Management Cooperation which needs considerable capacity building to effectively move their mandate to manage waste at a national level. The Environment Protection Agency (EPA) is the regulatory body and has been the UNDP partner in the UNDP support to strengthening the waste management sector. UNDP has supported development of a Waste Management Policy and draft Waste Management Regulations. These now need to be realigned with the current policies.

Some of the support through UNDP projects has been to provide waste management/collection centres. However, these centers have not been utilised to the fullest due to lack of larger systems to address waste that cannot be managed at island level. Added to this are the 'softer' issues of cost recovery of running such a centre (waste collection, wages, maintenance, etc), as well as the knowledge of the communities on waste management issues.

1.5. Project Site: Fares-Maathoda

The island of Fares-Maathodaa is home to 936 people (Census 2006). It was originally two separate islands (Fares and Maathoda) until they were joined by the reclamation of the shallow water passage between them during 1990s. This reclamation was associated with the construction of a small-craft harbour for the two islands. According to the local population, high surges between the islands are a common event that usually occurs during the southwest monsoon when the swells in the open sea are long and high. Prior to the blocking of the passage, there had been years in which the surge water through the passage had caused flooding of the islands but in a much limited scale with inundation widths in the order of 10 m along the shore.

During the four day period commencing on 15th May 2007, powerful swells hit many islands throughout the Maldives. According to the Department of Meteorology, Maldives, the swells were due to the waves of height 3-5 m, generated by a polar storm 5600 km (3,500 miles) southwest of Maldives (near 50° South latitude, off the coast of South Africa). After generation, the waves travelled in a northeasterly direction over thousands kilometres across the Indian Ocean over a period of a few days. Huvadhu Atoll was the most severely affected among all the 18 affected atolls with 88 islands. The maximum inundation measured was in excess of 1.5 m on the island of Fares-Maathodaa in the Atoll.

The island of Fares encountered intense flooding for three consecutive days. The swell was washed ashore in a southwesterly direction. The entire island of Fares was flooded on 17 May 2007 and nearly one third of Maathodaa Island was also flooded. The maximum inundation was observed to be 1.5 m (5 feet) in area of the shoreline with a declining gradient, 1 m (3 feet) at the centre of the island and approximately 0.3 m (1 foot) at the end of the island opposite to the direction of wave approach.

Although Fares-Maathodaa had not reported flooding of such scale since the reclamation of the passage until May 2007, rainy seasons continue to flood parts of the island; mostly at the edges of the reclamation and at the two swampy areas on Fares and Maathodaa sides. Such events disrupt normal life, especially to those living around these areas.

These observations indicate that the extremely high wave conditions, similar to the swells in May 2007 are not very frequent and the impacts of such high wave conditions have been aggravated as a result of the closure of the gap between the two islands. However with climate change, similar wave patterns are expected to increase in frequency and scale as result of the increasing sea levels being coupled with more frequent and intense storm weather systems.

Livelihoods in Fares-Maathoda

Fares and Maathoda were swampy land and traditionally the locals depended largely on agriculture. The main crop were taro (yam) grown in ditches near the fresh water ponds. Given the location in the archipelago, the islands of Maathodaa and Thinadhoo (further north in the atoll) had also been traders' stops for vessels travelling from Male' to the atolls of Fuammulah and Addu in the south.

Now, the communities depend largely on fishing. Catches by local fishermen are sold to MIFCO collector vessels or to the fish processing factory on the island of Kooddoo (on the eastern side of the same geographic atoll.) The community aspires to make Fares-Maathodaa a fishermen's hub, where fishing vessels could conduct maintenance, refuel, and trade. There are a few fish processing units that the locals are operating to prepare MaldiveFish, dried fish or fish paste.

A second livelihood activity on the island is harvesting sea cucumbers (an echinoderm from the class *Holothuroida*). These are harvested from the shallows around the island, and the dried sea cucumber are sold to markets in Male'. The community operates individually, but there is potential and interest for them to group and farm sea cucumber.

Although there are these economic activities supporting the community, entrepreneurship is low in the island. Local shops are operated on an ad-hoc basis and long term profit-based planning is not a feature of such businesses. These are largely due to lack of capacity of the community to undertake their operations as business ventures.

Local waste management issues

During the field visit to FaresMaathodaa it was very obvious to the team that the island is facing severe issues with regards to waste management. Garbage were dumped at various locations around the islands. The marshy area which was previously used for agriculture, is now littered with solid waste. There is no collection or sorting facility for garbage generated on the island. While there is a fisher-community, fish waste is not utilised, for example for making composting. The general population of the island does not have the capacity to address these issues without some external intervention. Behaviour change could address some of the issues such as garbage disposal, waste minimisation and waste utilisation.

2. STRATEGY

This project is designed to integrate its findings and experience into the “Integrating Climate Change Risks into Resilient Island Planning” (ICCR) project. The Ministry of Housing and Environment is implementing this UNDP project, supported by the LDCF of the UNFCCC through the GEF mechanism. ICCR Project contributes to the national goal of mainstreaming climate risk planning and climate change adaptation into the country’s development policy and planning frameworks across all sectors. It aims to achieve this by overcoming the key barriers to such mainstreaming (Section 1.3) in the areas of land use planning, coastal protection and coastal development, which have been identified as areas needing urgent and immediate attention in the country’s NAPA. The ICCR Project will also capture the lessons learnt from this project and use them in information and communication materials (giving due recognition to this project.) This project will directly contribute to the following outcomes of the ICCR Project:

Outcome 2: Integration of climate risk planning into key national policies that govern or impact land use planning, coastal protection and development

Outcome 3: Locally prioritized, appropriate adaptation options that reduce exposure to climate change risks demonstrated

Outcome 4: Project knowledge and lessons learned compiled, analyzed and disseminated locally, nationally and internationally

Given the size of the project, it will target interventions that will contribute to any future interventions. The Ministry of Housing and Environment and the community already has a vision of how they perceive the land use of the island. As such, the project will formulate engineering options that will not hinder future interventions that may come in as per the vision.

In addition to the above, the project will also contribute to the existing Global Environment Facility (GEF) Small Grant Programme (SGP) implemented by UNDP. The aim of this contribution will be to support community build and strengthen their own resilience through small projects implemented by them. The GEF SGP is global programme supports civil society and community based organizations in developing countries to implement activities towards biodiversity conservation, climate change mitigation, protection of international waters, prevention of land degradation and elimination of persistent organic pollutants through sustainable community based approaches. Grants under the SGP are made directly to Community Based Organizations (CBOs) and Non-Governmental Organizations (NGOs). Academic and scientific institutes, youth and other groups are also eligible. The maximum grant amount per project is US\$50,000, for a duration of up to 24 months, although most grants are expected to be much smaller. This programme reaches out to the communities to address and overcome local issues more appropriately.

2.1. Project Rationale and Limitations

The Government of Denmark and UNDP Maldives signed a Memorandum of Understanding (MoU) on 22nd November 2010 providing a framework for cooperation and facilitating collaboration between Denmark and UNDP in the areas of increasing resilience of communities of Maldives to the impact of climate change. This MoU was also signed by the Government of Maldives expressing the support of Maldives. The MoU directed to an initial collaboration concept which was to take form of a Project Document of approximately five million Danish Krone. The initial engagement was also envisaged to undertake the development of a second engagement of a multi-year duration focusing on contributing to “low emission climate resilient development” (LECReD) of an atoll in Maldives.

The above mentioned forms the basis for this Project Document.

This project does not attempt to provide a complete comprehensive solution to the climate change related challenges faced by the target communities. It attempts to present low cost, locally appropriate, and immediate adaptation options, specifically coastal and drainage management

options, which contribute to strengthening the community resilience. While developing these alternatives the project will, among other factors, consider the funds that are available to implement such options.

While this project does not address fresh water management directly, the drainage management component is envisaged to contribute to the improvement of the quality of the water aquifer of the by limiting the salt water intrusion into it. The drainage system will not attempt to provide ground water recharge coverage to the island but will attempt to address storm and flood water drainage.

2.2. Project Outputs/activities

The overall goal to which the project will contribute is: “To increase the resilience of the Maldives in the face of climate change and improve country capacity to respond effectively to climate related hazards”. As the intention of this project is to contribute to increasing the resilience of a community to climate change impacts, and while it is presenting a case in this regard, this goal is similar to the goal of the ICCR project.

Output 1: Identify & develop locally appropriate adaptation options on coastal management & drainage management

Potential engineering options, details of proposed initial activities and envisaged implementation approach that will be considered in this output are annexed as Annex 2.

On completion of Output-1, a Project Review Report will be done to identify and bring adjustments, if necessary, within the remaining project activities and project budget components (refer Monitoring Framework and Evaluation section)

Indicative activities under Output 1:

- 1.1. gather all locally available information
- 1.2. collection of available climatic, geophysical and hydrological data relevant to the project site
- 1.3. formulation of different engineering options and identification of a best option for coastal modification
- 1.4. formulation of different engineering options and identification of a best option for drainage management
- 1.5. stakeholder consultations on alternative options and determining the locally appropriate options for coastal modification and drainage management
- 1.6. Prepare detailed engineering designs
- 1.7. Prepare detailed implementation plans for coastal and drainage options

Output 2: Implement locally appropriate adaptation options

Having identified the appropriate engineering options, this Output undertakes all the implementation of the options. During implementation phase (as suggested in Annex 2), local employment will be sought as much as possible with the aim of increasing the ownership and sustainability of the interventions as well as to provide direct support to community livelihood.

Indicative activities under Output 2:

- 2.1. Undertake construction of coastal modifications
- 2.2. Undertake construction of surge flow drainage system

Output 3: Integration with existing GEF SGP

To support the local communities develop their resilience, this output targets to strengthen the community capacities to implement project that contribute to their livelihoods through the use of environmental resources available locally

Indicative activities under Output 3:

- 3.1. Conduct a community workshop on establishing NGOs/CBOs
- 3.2. Conduct training for NGOs/CBOs on preparing and implementing small projects
- 3.3. Undertake call for, screening, and awarding of approximately 10 small grant proposals

Output 4: Raise community awareness on waste management issues facing the island

To address the critical and acute issue of waste management, local awareness will be raised through this output.

Indicative activities under Output 4:

- 4.1. Conduct community based waste identification exercise
- 4.2. Conduct two workshops on awareness raising and developing community practices on waste management focusing on waste minimisation
- 4.3. Support the utility company in the atoll in formulating sustainable options for waste disposal

Output 5: Plan a “low emission, climate resilient development” programme for an atoll, by scaling-up past experiences

This output will be developing a programme to scale up existing applicable experience from island level to an entire atoll, integrating solutions and practices developed wherever possible in pilot projects. These include efforts in ecosystem management, coastal adaptation, renewable energy options, water management, sustainable livelihood linkages, etc. The planning process will seek where appropriate to include; addressing coastal management, reef management, energy efficiency, renewable energy, energy access, integrated waste management, integrated water resource management and sustainable livelihoods to increase community resilience. The final Programme Proposal is envisaged to set the trail for other similar interventions in Maldives in addressing climate change.

Indicative activities under Output 5:

- 5.1. Gathering lessons learnt from pilots and demonstrations of different development projects
- 5.2. Conduct stakeholder consultations on lessons learnt
- 5.3. Compile final “Project Lessons Learnt” document
- 5.4. Develop a Low Emission, Climate Resilient Development (LECREd) approach for an atoll
- 5.5. Develop site-selection criteria
- 5.6. Select LECReD atoll based on a multi-stakeholder approach
- 5.7. Refine LECReD approach for the selected atoll

3. ANNUAL WORK PLAN

Year: 2011

| EXPECTED OUTPUTS | PLANNED ACTIVITIES | TIMEFRAME | | | | RESPONSIBLE PARTY | PLANNED BUDGET ⁵ | | |
|--|--|-----------|-----|-----|-----|-------------------|-----------------------------|--------------------|----------------|
| | | Q 1 | Q 2 | Q 3 | Q 4 | | Funding Source | Budget Description | Amount |
| Output 1: Identify & develop locally appropriate adaptation options on coastal management & drainage management | | | | | | | | | 181,200 |
| | 1.1. gather all locally available information | | | | | UNOPS | | | 10,000 |
| | 1.2. collection of available climatic, geophysical and hydrological data relevant to the project site | | | | | UNOPS | | | 12,200 |
| | 1.3. formulation of different engineering options and identification of a best option for coastal modification | | | | | UNOPS | | | 90,000 |
| | 1.4. formulation of different engineering options and identification of a best option for drainage management | | | | | UNOPS | | | 30,000 |
| | 1.5. stakeholder consultations on alternative options and determining the locally appropriate options for coastal modification and drainage management | | | | | UNDP | | | 10,000 |
| | 1.6. Prepare detailed engineering designs | | | | | UNOPS | | | 19,000 |
| | 1.7. Prepare detailed implementation plans for coastal and drainage options | | | | | UNOPS | | | 10,000 |
| Output 2: Implement locally appropriate adaptation options | | | | | | | | | 375,000 |
| | 2.1. Undertake construction of coastal modifications | | | | | UNOPS | | | 180,000 |
| | 2.2. Undertake construction of surge flow drainage system | | | | | UNOPS | | | 195,000 |
| Output 3: Integration with existing GEF SGP | | | | | | | | | 70,500 |
| | 3.1. Conduct a community workshop on establishing NGOs/CBOs | | | | | UNDP | | | 7,000 |

⁵ Budget is expressed in US Dollar conversion of Danish Kroner as prescribed in the cover page of this project document

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| | 3.2. Conduct training for NGOs/CBOs on preparing and implementing small projects | | | | | UNDP | | | | 7,000 |
| | 3.3. Undertake call for, screening, and awarding of approximately 10 small grant proposals | | | | | UNDP | | | | 56,500 |
| | Output 4: Raise local awareness on waste management issues facing the island | | | | | | | | | 19,000 |
| | 4.1 Conduct community based waste identification exercise | | | | | | | | | 7,000 |
| | 4.2 Conduct a workshop on awareness raising and developing community practices on waste management focusing on waste minimisation | | | | | | | | | 7,000 |
| | 4.3 Support the utility company in the atoll in formulating sustainable options for waste disposal | | | | | | | | | 5,000 |
| | Output 5: Plan a “low emission, climate resilient development” programme for an atoll, by scaling-up past experiences | | | | | | | | | 53,000 |
| | 5.1. Gathering lessons learnt from pilots and demonstrations of different development projects | | | | | UNDP | | | | 2,000 |
| | 5.2. Conduct stakeholder consultations on lessons learnt | | | | | UNDP | | | | 8,000 |
| | 5.3. Compile final “Project Lessons Learnt” document | | | | | UNDP | | | | 3,000 |
| | 5.4. Develop a Low Emission, Climate Resilient Development (LECRd) approach for an atoll | | | | | UNDP | | | | 30,000 |
| | 5.5. Develop site-selection criteria | | | | | UNDP | | | | - |
| | 5.6. Select LECReD atoll based on a multi-stakeholder approach | | | | | UNDP | | | | 5,000 |
| | 5.7. Refine LECReD approach for the selected atoll | | | | | UNDP | | | | 5,000 |
| | Project/Programme Management | | | | | | | | | 125,225 |
| | Programme Manager ⁶ (part time) | | | | | UNDP | | | | 62,000 |
| | Project manager ⁷ (full time) | | | | | UNDP | | | | 25,225 |
| | Project associate ⁸ (full time) | | | | | UNDP | | | | 18,000 |

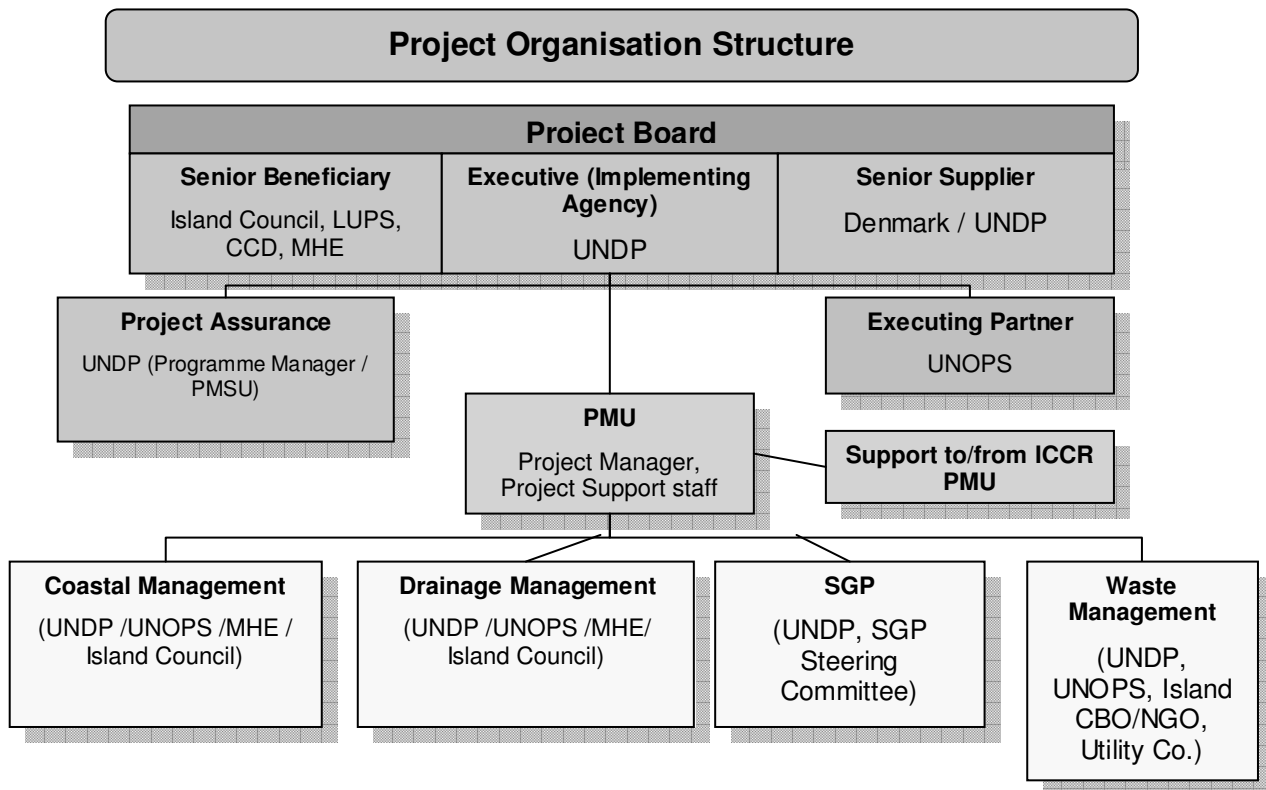
⁶ Programme Manager: 1/4 costs of a P5 (international) staff is covered under this project, for provision of project oversight

⁷ Project manager would be hired at UN 'Officer level' qualifications and salary scale

⁸ Project associate will be hired at UN 'Associate level' qualifications and salary scale

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|-----------------------------------|---------------------------------|--|--|--|--|------|--|--|----------------|
| | Project Monitoring & Evaluation | | | | | UNDP | | | 20,000 |
| General Management Services (7%) | | | | | | | | | 57,675 |
| Total Project Budget (USD) | | | | | | | | | 881,600 |

4. MANAGEMENT ARRANGEMENTS



The Project will be implemented over an year by UNDP under the Direct Implementation (DIM) modality and will be housed at the UNDP. The Fares-Maathoda Island Council, the LandUse Planning Section and the Climate Change Division of the Ministry of Housing and Environment will be the key beneficiaries of the project and its outputs.

The Project Board (PB) is the strategic decision-making body of the project. It will provide overall guidance and direction to the project, and also be responsible for making decisions on a consensus basis, when high-level strategic guidance is required, including the approval of major revisions in project strategy or implementation approach. The Project Board will meet at least twice per year. The Resident Representative of UNDP Maldives will chair the PB.

Project Management Unit (PMU): The UNDP will provide office space for the Project Management Unit (PMU) and its staff. The UNDP will provide logistics such as email, telephone and fax services for the PMU. The PMU staff will be funded by the project throughout its duration to ensure the delivery of results as specified in the Project Annual Workplan. The PMU will be led by a Project Manager. The PMU shall also prepare communications and information material in addition to the material used for consultations, targeting the broader technical and non-technical audiences. Media briefs and updates shall be facilitated by the PMU during landmark events/activities of the project.

Executing Partner: UNOPS will be the primary Executing Partner for this project. Specifically, the larger outputs (output 1 and 2), conducting the technical assessments and undertaking the construction of identified options will be executed by UNOPS. UNOPS will also contribute to the other outputs and project management. This relationship will be governed by the global UNDP-UNOPS Memorandum of Understanding.

Project Manager (PM): The PM is a full time project-funded staff who will perform the following key functions. The PM will be hired at “Officer” level of UN staff grades. The PM will be appointed by the Implementing Agency, report to the Programme Manager and receive guidance from the PB.

The PM is responsible for the day-to-day management, administration, coordination, and technical supervision of project implementation. S/he will monitor work progress, and ensure timely delivery of Outputs as per the Annual Workplan and within budget. The Project Manager will ensure a high quality of project planning, management and technical and financial progress monitoring and reporting. The PM will be supported by a Project Associate/Assistant who will be hired at “associate” level of UN staff grade.

Project Assurance: UNDP will ensure the application of UNDP administrative and financial procedures for the use of the Project funds. UNDP will ensure project monitoring and evaluation according to an agreed schedule and in line with UNDP and donor requirements, as described further in Section 5 below. UNDP will assist in compiling lessons learned and sharing project experiences on a national, regional and international basis.

5. MONITORING FRAMEWORK AND EVALUATION

In accordance with the programming policies and procedures outlined in the UNDP User Guide, the project will be monitored through the following:

Within the annual cycle

- On a quarterly basis, a quality assessment shall record progress towards the completion of key results, based on quality criteria and methods captured in the Quality Management table below.
- An Issue Log shall be activated in Atlas and updated by the Project Manager to facilitate tracking and resolution of potential problems or requests for change.
- Based on an initial risk analysis, a risk log shall be activated in Atlas and regularly updated by reviewing the external environment that may affect the project implementation.
- Based on the above information recorded in Atlas, a Project Progress Reports (PPR) shall be submitted by the Project Manager to the Project Board through Project Assurance, using the standard report format available in the Executive Snapshot.
- a project Lesson-learned log shall be activated and regularly updated to ensure on-going learning and adaptation within the organization, and to facilitate the preparation of the Lessons-learned Report at the end of the project
- a Monitoring Schedule Plan shall be activated in Atlas and updated to track key management actions/events
- In line with the HACT policy, a monthly spot-check will be done by the UNDP Project Management Support Unit (PMSU).

Annually

- **Annual Review Report.** An Annual Review Report shall be prepared by the Project Manager and shared with the Project Board. As minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the QPR covering the whole year with updated information for each above element of the QPR as well as a summary of results achieved against pre-defined annual targets at the output level.
- **Final Project Review.** Based on the above report, a final project review shall be conducted during the fourth quarter of the year or soon after, to assess the performance of the project and appraise the Annual Work Plan (AWP). This review will be a final assessment. This review is driven by the Project Board and may involve other stakeholders as required.

Additionally, immediately upon completion of Output-1, a Project Review Report will be done to identify and bring about any adjustments needed within the remaining project activities and project budget components. Such changes will be brought about with the Project Board endorsement and in close collaboration with the Government of Denmark.

6. SCHEDULE OF PAYMENTS

In the donor shall, in accordance with the schedule of payments set out below, contribute to UNDP Maldives for this project the amount of kr 5,000,000.00 (five million Danish Krone). The contribution shall be deposited in the following account upon signature of this Project Document.

Account Name: UNDP Representative in Maldives USD Account
Address: Bank of America, 1401 Elm St., Dallas TX 75202
Account No. 3752218231
ACH Routing Number: 111000012 (*To be used only by US-based banks using ACH payment type*)
Wire Routing Number: 026009593
SWIFT Address: BOFAUS3N

| <u>Schedule of Payment</u> | <u>Amount</u> |
|--------------------------------|---------------|
| December 2010 (upon signature) | 5,000,000 kr |

7. LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, 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.

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.

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 this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the 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/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document".