



Ministry of Environment
Male', Republic of Maldives.

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Support vulnerable communities in Maldives to manage climate change-induced water shortages

CIVIL ENGINEER

TERMS OF REFERENCE

A. PURPOSE

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. 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. The Government faces constraints in responding to the challenge at hand without assistance, especially in the context of anticipated impacts of climate change.

In response to this climate challenge, the joint Government of Maldives and UNDP 5-year USD 26 million project to “**Support vulnerable communities in Maldives to manage climate change-induced water shortages**” has the objective 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:

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

The proposed adaptation solution is to 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).

The project is one of the first projects to be funded through the Green Climate Fund and is implemented by joint partnership between Ministry of Environment (ME) and UNDP from 2016 through to 2020.

The Government of Maldives through the Ministry of Environment is seeking a full time **Civil Engineer (CE)** to provide technical assistance and input to the project.



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B. BACKGROUND

The unique geographic attributes of the Maldives make its water resource situation both complex and diverse. With widely ranging populations numbers on the islands, even basic water and sanitation service must be tailored to local resources and population needs. Management of the limited water resources is complicated due to the small catchment areas for rainfall, limited rainwater and groundwater storage capacity, long dry seasons, and the susceptibility of groundwater aquifers to pollution and salinity intrusion.

The outer islands of the Maldives already experience drinking water shortages during the dry season. These shortages have had significant adverse human, environmental and social impacts on the outer island communities. 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. A sea level rise 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.

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; (ii) groundwater controlled extraction and replenishment to keep water table levels high in order to buffer away saltwater intrusion; and (iii) increased water production capacity through desalinization (Reversed Osmosis – RO technology), as to secure sufficient back up resource during the extended dry periods for household supply and timely distribution.

In response to this challenge, the proposed **project objective** is to deliver safe and secure freshwater to 105,000 people in the 49 target islands of Maldives in the face of climate change risks. This will be achieved by delivering the following **results**:

- a. Scaling up integrated water supply system to provide safe water to vulnerable households (at least 32,000 people, including 15,000 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;

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 Malé, 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.

Water stress alert 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 Meteorological - MMS services on reaching out to the communities actionable early warning information, and preparing the water utilities, island councils and 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 workstream 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 to manage service delivery, and of the decentralized authorities and central government to provide an enabling environment for sustainability and scale up.

C. OBJECTIVES OF ASSIGNMENT

The objective of this assignment is to give technical assistance and input where necessary to the development and implementation of the project to “**Support vulnerable communities in Maldives to manage climate change-induced water shortages**” implemented by the Ministry of Environment.

D. OVERALL RESPONSIBILITY

The overall responsibilities of the Engineer include, but are not limited to the following:

1. Provide advice to the Project Manager and Project Coordinator(s) on all technical aspects of the Project;
2. Carry out inspection trips to project sites to monitor works and ensure compliance with general requirements of Engineering Standards/practices including the environmental issues as applicable to the project.

E. SCOPE OF WORKS

The work of the Civil Engineer will include the following tasks, among others:

1. Visit project sites and inspect the civil works of the water supply system and rainwater harvesting systems and give site specific suggestions where necessary.
2. Designing water supply system and rainwater harvesting systems in the islands and preparation of bid documents, contract documents and technical reports.
3. Assist and advice Ministry of Environment in carrying out feasibility assessments and scoping support required for sustainable management of community water supply and sanitation services.





4. Assist the staff during field surveys and site visits and provide guidance to the staff in carrying out the works effectively.
5. Advice in the tendering process including, procurement and contract negotiations stage.
6. Assist and advice PMU in preparing and revising project activities and financial plans and when required by the Government and the relevant funding agency;
7. Assist in the review/evaluation of project reports and documents
8. Participate in funding agency review missions / or review carried out by Government of Maldives authorities as required; and participate in committee meetings that may be formed under the project as required;
9. Assist and advice PMU in preparing information/reports such as annual work plan, annual project review reports, project progress reports, bi-annual reports, quarterly reports etc. and other documentation requested by Ministry of Environment or funding agency for review and/or for presentation
10. Assist and advice the Ministry in developing and reviewing proposals, concept and designs pertaining to water and sewerage projects and provide necessary comments and suggestions.
11. Undertake capacity building to enhance skills and competencies of Ministry of Environment staff(s) including but not limited to (a) design and evaluation of water supply and sewerage systems (b) contract negotiations / evaluation (c) preparation of bid / contract documents (d) project management & monitoring and (e) empowering local communities to operate and maintain the systems in sustainable manner.
12. Undertake capacity building to enhance skills and competencies of Ministry of Environment staff(s) including but not limited to (a) design and evaluation of water supply and sewerage systems (b) contract negotiations / evaluation (c) preparation of bid / contract documents (d) project management & monitoring and (e) empowering local communities to operate and maintain the systems in sustainable manner.
13. Review the operation and maintenance manuals submitted by the contractors; and provide guidance where necessary in establishing operation and maintenance procedures for water supply and sewerage systems in consultation with Ministry of Environment and the island communities.
14. Undertake other technical tasks as and when required by the Ministry of Environment.



F. QUALIFICATIONS AND EXPERIENCE

1. A Bachelor degree or higher in civil or environmental engineering.
2. Must have professional work experience in the field of civil engineering or a related field of at least five (05) years with minimum three (03) years field experience in a construction site management or construction site supervision role.
3. Previous experience of working in design and supervision of water and sewerage projects will be an added advantage.
4. Previous experience working on projects financed by donor agencies will be an added advantage.
5. Should possess sound knowledge of computer aided design software/applications and Microsoft office Package
6. Should have excellent command over English with proven communication and, presentation and negotiation skills
7. Should be capable of providing leadership, motivation and training to the staff and stakeholders
8. Previous Experience of working in the Maldivian construction industry will be an added advantage
9. Should have strong leadership, management and communication skills in presenting, discussing and resolving difficult issues and have ability to work efficiently and effectively with a multidisciplinary team.

The successful individual must be willing to work for extended periods without direct supervision and travel routinely to islands within the catchment.

In addition, the individual's reputation of integrity and impartiality routed in independent from third parties shall be considered.

The short-listed candidate will be requested to participate in personal interviews and submit the names and contact details of personal referees who can attest to their ability.

The successful candidate must understand the objectives and delivery mechanisms of the project's portfolio. He/she must be willing to work in a team, be flexible to emerging or changing conditions, and undertake initiative in his/her broad field of actions.



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G. SELECTION CRITERIA

Evaluation of Proposal submitted and face to face interview of the individual will be evaluated as indicated below:

Step I: Desk review: (60 points) – Minimum passing score is (50)

A desk review will be conducted to produce a shortlist of candidates, in reference to the Selection criteria table below and Section F of the TOR.

Step II: Interview: (40 points)

A competency-based Interview will be conducted for candidates shortlisted from the desk review, interview will consist of a presentation by the bidder and a panel interview based on the following:

- Relevant experience
- Sector Knowledge
- Working Skills

Selection Criteria (100% weight)						
Desk Review (60 points)					Interview (40 points)	Total score 100 points
Education	Work Experience					
A Bachelor degree in civil or environmental engineering. 10 points <i>Additional scores:</i> 5 point additional for master's degree in a related discipline.	Professional work experience in the field of civil engineering or a related field of at least five years (20 points)	minimum three (03) years field experience in a construction site management or supervision role. (15 points)	Previous experience of working in design and supervision of water and sewerage projects will be an added advantage . 2.5 points for each year for a maximum of 2 years.	Previous experience working on projects financed by donor agencies 2.5 points for each year for a maximum of 2 years.		
15	20	15	05	05	40	100



H. REPORTING REQUIREMENT

1. Report directly to the Project Manager on all aspects of Project Management throughout the duration of the contract unless otherwise advised by the Client.
2. The Engineer should report to work on week days from 0800 – 1600 hours other than public holidays and provide services to the Client for an average of 40 hours a week. Remuneration for less than 8 hours work per day will be on a pro-rate basis and is required to work additional hours to complete the assigned tasks on a daily basis.
3. The Engineer shall ensure that all the required reports for the project are prepared on time, in accordance with the requirements of Client and respective donor agencies.
4. The Engineer is required to report to work in official attire.

I. SCHEDULE FOR THE ASSIGNMENT

Duration of the assignment is **12** months from the commencement of the works with potential extension based on performance and need. The successful candidate is expected to commence the services in Nov 2019.

J. SALARY

Successful individual will be paid an all-inclusive monthly fee of MVR 19,800-22,770 depending on experience and qualification.



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