UN environment programme

CTCN UN Climate Technology Centre & Network

**Technical Assistance Response Plan – Terms of Reference**

| Country | Republic of Maldives |
|---|---|
| Request ID# | 2022000013 |
| Title | Developing design criteria and technical specifications for sustainable stormwater management systems in the islands to address climate change impacts in Maldives |
| NDE | Mr. Ahmed Waheed<br>Director, Climate Change Department<br>Ministry of Environment, Climate Change and Technology<br>Republic of Maldives<br>Email: ahmed.waheed@environment.gov.mv |
| Proponent | Mr. Mohamed Musthafa<br>Director General, Water and Sanitation Department<br>Ministry of Environment, Climate Change and Technology<br>Republic of Maldives<br>Email: mohamed.musthafa@environment.gov.mv |

**Summary of the CTCN technical assistance**

The objective of this technical assistance is to develop Technical Specifications and Guidelines for sustainable storm water management systems in Maldives. To this end, a stocktake of both the institutional and technical aspects of current storm water management in the country will be conducted, as well as a review of experiences and best practices of sustainable storm water management and drainage systems in other countries which are applicable to the Maldives context. This will inform the development of design criteria and technical specifications for such systems to be used in the future in the islands. Three sites will be selected for the development of the technical specifications and guidelines that will assist urban designers and engineers to select the appropriate technology solutions according to the site-specific conditions. To ensure that the guidelines and technical specifications produced under this technical assistance can be effectively used by the relevant institutions and stakeholders, a hands-on capacity building programme will be rolled out. In addition, a draft GCF concept note will be developed to facilitate access to climate financing necessary to scale up the implementation of sustainable storm water management systems in the islands.

The scope of work includes the following components:

1. Stocktake of stormwater management and drainage systems
This activity covers a review of the institutional/regulatory framework for stormwater management systems, a stocktake of the existing flood, stormwater and drainage management systems (including a technical review of water management plans and urban planning information systems/ software/ GIS decision support tools in use) to identify gaps. This will be used to inform the development of technical specifications, capacity building programme and proposal for accessing climate finance to scale up implementation of sustainable storm management systems in the country.

2. Development of the technical specifications and guidelines
Data will be collected for 3 selected sites in Ha. Thakandhoo, R. Inguraidhoo, S. Hulhudhoo islands, in consultation with the Department of Water and Sanitation and the NDE, and technical specifications will be developed for at least 3 technology solutions for sustainable storm water management systems for these sites. This work will involve modeling of the different technology

solutions under different local flooding scenarios, and assessment of socio-economic benefits of different the infiltration-based drainage methods. Guidelines to assist urban planners and engineers select the appropriate technical design according to the site-specific conditions will also be developed.

3. Capacity building programme and draft of GCF concept note
To ensure the effective design and implementation of sustainable stormwater management and urban drainage systems (and the effective use of technical specifications and guidelines developed) going forward, a capacity building training programme will be conducted. In addition, a Green Climate Fund concept note will be drafted, in collaboration with the NDA, to facilitate access to climate finance to scale up implementation of these system in the islands.

**Agreement:**

*(If possible, please use electronic signatures in Microsoft Word file format)*

**National Designated Entity to the UNFCCC Technology Mechanism**

Name: Mr. Ahmed Waheed
Title: Director for Climate Change
Date: 16 August 2022
Signature:

**Proponent** (signature of the Proponent is optional)

Name: Mr. Mohamed Musthafa
Title: Director General, Water and Sanitation
Date: 16 August 2022
Signature:

**UNFCCC Climate Technology Centre and Network (CTCN)**

Name: Rose Mwebaza
Title: CTCN Director
Date: 17.08.2022
Signature:

## 1. Background and context

The Maldives consists of 26 natural atolls, comprising of 1,192 small, low-lying coral islands, stretching north to south over a total area of 90,000 sq.km. The population of Maldives is 407,660 (Census: 2014) dispersed over 188 islands. These islands do not have surface freshwater. Freshwater resources in Maldives are very scarce and the scarcity is both temporal and spatial. The main natural freshwater resources available in the country are groundwater aquifers that occur in the porous coral sands and rainfall.

Groundwater lenses in the islands lie at an average depth of 1-1.5 m below the ground surface. They exist as thin freshwater lenses floating on top of the underlying saline water. Traditionally drinking water was abstracted from these shallow aquifers using hand-dug open wells. However, in many inhabited islands of Maldives, fresh groundwater has been depleted as a result of salt-water intrusion due to over-extraction of fresh groundwater. The shallow depth of the groundwater lenses of the islands makes this freshwater resource vulnerable and susceptible to contamination from land-based human activities. Hence, people are reluctant to use groundwater for drinking or cooking as the quality has deteriorated.

Climate change and the events resulting from it such as sea level rise and changes in precipitation patterns have increased the frequency and intensity of flooding events in the country. This continues to affect the freshwater lens in most islands and consequently the society as a result of flooding due to heavy rainfall and inundations.

Recognizing the critical importance of responding more effectively to the challenges posed by climate change, the country has highlighted the need for building flood resilient island communities in its Water Resource Protection and Management Regulation (2021 R-22) and in the Strategic Action Plan for Water and Sewerage (2020-2025). The Maldives updated NDC and the Maldives Climate Emergency Act has also emphasized building resilient communities by providing better climate-proof infrastructure including flood mitigation measures.

The establishment of drainage systems are used as a mitigation measure to combat and reduce the effects of flooding in islands and to preserve the fresh ground water lens in island. Thus, the need for effective technical specifications and guidelines is of utmost importance.

## 2. Problem statement

As indicated above, climate change is causing severe environmental, social and economic impacts in Maldives. In particular, the impact from increased frequency and magnitude of flooding events brought about by climate change continues to be a major development challenge for the country.

Maldives updated NDC and the Maldives Climate Emergency Act have emphasized the need to building resilient communities by providing better climate-proof infrastructure including flood mitigation measures. However, at present, the country´s infrastructure, including stormwater and urban drainage infrastructure, is still vulnerable to climate change, in great part due to the lack of physical and technical institutional capacity to cope with the increased challenges posed by increased frequency and magnitude of flooding events.

One of the critical gaps identified in is the need for adequate technical specifications and guidelines for the design of sustainable (climate proofed) stormwater and urban drainage systems, as well as the development of capacity of technical staff and access to financing.

This technical assistance has been designed to provide technical specifications and guidelines for the design of stormwater systems under different conditions in the Maldives, and to build the necessary capacity of technical staff to effectively use modeling and technical specifications and guidelines that are customized for the Maldives context. Furthermore, a GCF concept note will be drafted, as a first step to help the country accessing needed financing to scale up the implementation of sustainable stormwater and urban drainage systems.

### 3. Logical Framework for the CTCN Technical Assistance:

*(Guidance: Please note that multiple activities lead to one Output, and multiple Outputs lead to one Outcome. There can be several Outputs, but only one Outcome description capturing the CTCN technical assistance. Deliverables are the products or services to be delivered to the NDE/Proponent/CTCN based on the Activities and the Outputs.)*

| | Week | | | | | | | | | | | |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| ***Objective:* Develop design criteria and technical specifications for sustainable stormwater management systems in the islands to address climate change impacts** | | | | | | | | | | | | |
| ***Outcome: Technical Specifications and Guidelines on sustainable storm management system (in Dhivehi)*** | | | | | | | | | | | | |
| **Output 1: Inception meeting and development of implementation planning and communication documents** | | | | | | | | | | | | |
| ***Activity 1:** All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance.*<br>**i)** An inception meeting is held and a detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan as well as contingency plans in the face of COVID-19 is discussed with project proponent and the NDE. The detailed work plan and budget must be based directly on this Response Plan;<br>**ii)** Based on the work plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. The monitoring and evaluation plan should apply selected indicators from the Closure and Data Collection report template and enable the lead implementer to complete the CTCN Closure and Data collection report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan);<br>**iii)** A two-page CTCN Impact Description formulated in the beginning of the technical assistance and update/revised once the technical assistance is fully delivered (a template will be provided);<br>**iv)** A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided). | | | | | | | | | | | |

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| **Deliverable 1:**<br>i) Report of inception meeting and detailed work plan<br>ii) Monitoring and evaluation plan<br>iii) CTCN Impact Description<br>iv) Closure and Data Collection report | | | | | | | | | | | | |
| **Output 2: Stocktake of stormwater management and drainage systems** | | | | | | | | | | | | |
| ***Activity 2.1:*** *Review of institutional/regulatory framework for stormwater management systems*<br>The lead implementer with support from the national expert(s) will carry out a review of existing regulations, guidelines, policies, and relevant documents in place and being drafted, used or in practice in the Maldives.<br>The lead implementer with support from national experts shall undertake preliminary meetings with relevant stakeholders and agencies to identify the policies and strategies of the government and relevant institutions with regard to flooding, storm water and drainage issues. | | | | | | | | | | | | |
| ***Activity 2.2:*** *Stocktake of stormwater management and drainage systems in the Maldives*<br>In addition, the team will conduct a stocktake of existing flood, stormwater and drainage systems to identify the gaps. The technical review may be facilitated through the technical drawings, maps of urban drainage systems and underground water management plans, maintenance records, and/or a walk through the selected system. Urban planning information systems/ software/ GIS decision support tools will also be reviewed. The gaps will be assessed in response to current and future needs, resources and social expectations of a city. | | | | | | | | | | | | |
| ***Activity 2.3*** *Review of best practices in stormwater management and drainage systems applicable to the Maldives context*<br>With reference to good practices of sustainable drainage system (SuDS) and stormwater management modelling (SWMM) from other countries/ cases applicable to the Maldives context, the team will synthesize suggestions and recommendations on regulations, guidelines, policies, government strategies, institutions, technologies, and the system specifications. | | | | | | | | | | | | |

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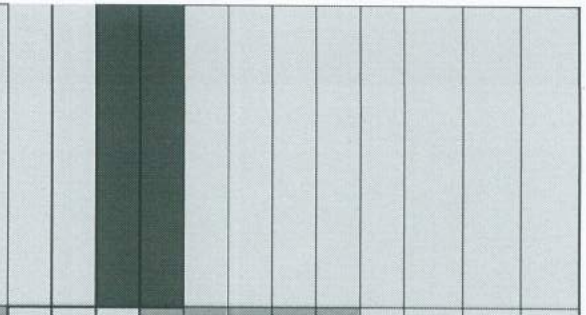
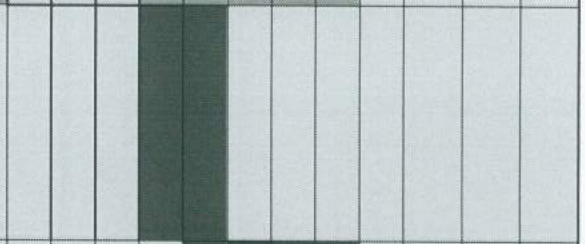
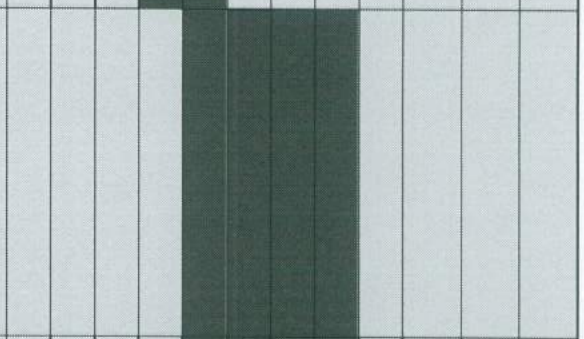
| **Deliverable 2:**<br>i) Report on the institutional and regulatory framework for stormwater management systems<br>- Review and suggestions on regulations, guidelines, policies, and government strategies and institutions with regards to flooding, stormwater, and drainage system<br>ii) Report on the stocktake of existing stormwater and drainage systems in Maldives and best practices of SuDS/SWMM applicable to the Maldives context<br>- Review of existing stormwater and drainage systems, best practices applicable to the Maldives context and suggestions on technological design |  |
| **Output 3: Development of the technical specifications and guidelines** |  |
| ***Activity 3.1:*** *Site data collection*<br>The lead implementer, in close consultation with the Department of Water and Sanitation (PP) and the NDE, will identify 3 sites for the development of technical specifications. The lead implementer will engage the national experts and work in collaboration with key stakeholders to collect input data on land use, typologies, flood risks, surface runoff, etc required for modelling and for development of the design criteria and the detailed specifications for the selected sites. |  |
| ***Activity 3.2:*** *Draft and development of the technical specifications and guidelines*<br>For the 3 selected sites, the lead implementer will develop technical specifications for sustainable storm management systems. In addition, guidelines for the design criteria for the sustainable stormwater management systems will be developed incorporating findings and recommendations from the stocktake analysis, and case studies undertaken in Activity 2. Using hydraulic and hydrologic modelling software, impacts of various infiltration techniques (building roofs, rainwater harvesting systems, road drainage infrastructure, etc) from the previous study (Ministry of Environment, 2020)[1] will be simulated and assessed against local flooding scenarios in different sites. This work will be conducted in parallel with and provide inputs to the capacity building training programme for technical staff under Activity 4.4. |  |
| ***Activity 3.3:*** *Analyse socio-economic benefits of sustainable stormwater management systems*<br>The lead implementer will analyse the socio-economic benefits of the various infiltration-based drainage methods using a gender mainstreaming approach in climate disaster risk management. To conduct this, |  |

[1] Ministry of Environment, (2021). A Guide to Groundwater Protection & Improvement Measures in Maldives. Male', Maldives

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| stormwater management will be systemically viewed as a climate change issue that has impacts on the community and their socio-economic activities. It shall be ensured that relevant stakeholders are identified and represented in the data collection and consultation on the productive use of stormwater in agriculture and beyond. | | | | | | | | | | | | |
| ***Activity 3.4:*** *Develop guidelines and conduct stakeholder meetings*<br>The lead implementer with support from national consultants will develop guidelines to assist urban planners and engineers select the appropriate technical design according to the site-specific conditions (the implementer may include as part of the guidelines a typology of common site-specific conditions/ parameters to be found in the Maldives). In addition, the team will conduct stakeholder meetings to discuss and receive feedback on the proposed technical specifications and guidelines. | | | | | | | | | | | | |
| **Deliverables 3:**<br>i) Draft of the technical specifications and guidelines - including socio-economic assessments and gender considerations<br>ii) Report on stakeholder meetings including the feedback for the suggested technical specifications | | | | | | | | | | | | |
| **Output 4: Finalization of the documents, draft GCF concept note, and capacity-building program** | | | | | | | | | | | | |
| ***Activity 4.1: Finalize the documents***<br>The lead implementer will finalize the documents. The final specifications (for the detailed engineering design) of 3 infiltration technologies on 3 sites and guidelines will be compiled as well as a draft of the GCF concept note shall be attached including costing analysis for future scale-up. | | | | | | | | | | | | |
| ***Activity 4.2: Draft GCF concept note***<br>Based on the information and technical specifications produced (including those for specific technologies and sites as a result of Activities 2 and 3, the lead implementer will explore options and provide recommendations as to the activities and resources needed to scale up this work (including costing analysis) and will prepare a draft GCF concept note.<br>The GCF guidelines to prepare GCF concept note are to be considered throughout all the activities listed above for better alignment of the deliverables with the requirements of the concept note. The lead implementer will ensure that the best available data and information generated from this TA will be used in filling of the draft GCF note template under this output.<br>The draft concept note will be prepared by following the GCF Concept note preparation guidelines, with the | | | | | | | | | | | | |

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| supporting documents listed below and as applicable:<br>i. Map indicating the location of the project/programme<br>ii. Diagram of the theory of change<br>iii. Economic and financial model with key assumptions and potential stressed scenarios<br>iv. Pre-feasibility study<br>v. Evaluation report of previous project<br>vi. Results of environmental and social risk screening<br>Any gaps identified in filling out the GCF note's template that does not fall under the purview of this Response Plan will be the responsibility of the PP/NDE/NDA of Maldives to suffice. The lead implementer will integrate inputs from PP/NDE/NDA of Maldives into a final draft GCF concept note. | | | | | | | | | | | | |
| ***Activity 4.3: Translate documents into the local language***<br>The lead implementer will translate the documents into the Dhivehi language for ease of use by local stakeholders and policymakers. | | | | | | | | | | | | |
| ***Activity 4.4: Capacity building programme***<br>The lead implementer will develop manuals and organize a capacity-building/training programme to train the relevant up-takers of the proposed technical design of the stormwater management and urban drainage systems. Identification of participants for the training will be done in close consultation with NDE and PP. The capacity building training program will (at a minimum) take the format of one in-person workshop, using training manuals prepared (as well as other materials and site visit), and will include a training component on integrated urban drainage modelling, and modelling exercises on different scenarios and development of a concept design (using data for the 3 selected sites for hands-on exercises, and showcasing work being conducted under Activity 3.2). The format of the capacity-building training programme will be finalized in consultation with NDE and PP, and it may include a final session where participants in the training and other relevant stakeholders (including policy makers from selected municipalities) are brought together to discuss results achieved in this TA. | | | | | | | | | | | | |
| **Deliverables 4:**<br>i) Final report on finalized technical specifications and guidelines in English and Dhivehi languages<br>ii) Draft of the GCF concept note (to be the included as an Appendix to the final report)<br>iii) Conduct a capacity building workshop (timed with Activity 3.2)<br>iv) Final report on the Capacity building training programme | | | | | | | | | | | | |

v) A training manual used in a capacity-building workshop (in English and Dhivehi languages)

**4. Resources required and itemized budget:**

*Please provide an indicative overview of the resources required and itemized budget required to implement the CTCN technical assistance, including for M&E-related activities, using the table below. Important to note that minimum 1% of the budget should explicitly target gender specific activities related to the technical assistance (please see section 10 for further information on gender). Once the Response Plan is completed, a Response Implementation partner(s) will be selected by the Climate Technology Centre (CTC). A detailed activity-based budget for the CTCN assistance will be finalized by the CTCN and selected Implementer.*

| **Activities and Outputs** | **Input: Human Resources** *(Title, role, estimated number of days)* | **Input: Travel** *(Purpose, national vs. international, number of days)* | **Inputs: Meetings/events** *(Meeting title, number of participants, number of days)* | **Input: Equipment/Material** *(Item, purpose, buy/rent, quantity)* | **Estimated cost** *Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan* | |
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| | | | | | **Minimum** | **Maximum** |
| **Output 1: Inception meeting, development of implementation planning and communication documents** | ***5,250-6,050*** | | | | **5,250** | **6,050** |
| Activity 1.1:<br>i) Inception meeting and formulation of detailed work plan; | IE1: 4 days<br>IE2: 3 days<br>IE3: 1 day<br>IE4: 2 days | | | | 5,250 | 6,050 |

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| ii) Monitoring and evaluation plan;<br>iii) CTCN Impact Description;<br>iv) Closure and Data Collection report. | NE1: 2 days<br>NE2: 1 day<br>NE3: 2 days | | | | | |
| **Output 2:** Stocktake of stormwater management and drainage systems | ***39,175-45,600*** | *International travel and DSA for 3 experts + Domestic travel USD **5,500*** | | | **44,675** | **51,100** |
| Activity 2.1: Review of institutional/regulatory framework for stormwater management systems | IE1: 5 days<br>IE2: 2 days<br>IE3: 3 days<br>IE4: 3 days<br>NE1: 10 days<br>NE2: 2 days<br>NE3: 3 days | | | | 7,975 | 9,450 |
| Activity 2.2: Stocktake of stormwater management and drainage systems in Maldives | IE1: 10 days<br>IE2: 5 days<br>IE3: 10 days<br>IE4: 7 days<br>NE1: 10 days<br>NE2: 3 days<br>NE4: 7 days | | | | 16,600 | 19,250 |
| Activity 2.3: Review of best practices in stormwater management and drainage systems applicable to the Maldives context | IE1: 10 days<br>IE2: 3 days<br>IE3: 10 days<br>IE4: 5 days<br>NE1: 7 days<br>NE2: 3 days | | | | 14,600 | 16,900 |

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| | NE3: 7 days | | | | | |
| **Output 3: Draft and development of the technical specifications and guidelines** | ***74,025-87,200*** | *International travel and DSA for 3 experts + Domestic travel* *USD **5,500*** | *Stakeholder consultation for 40 participants* *USD **3,500*** | | **83,025** | **96,200** |
| Activity 3.1: Site data collection | IE1: 7 days<br>IE2: 5 days<br>IE3: 5 days<br>IE4: 8 days<br>NE1: 12 days<br>NE2: 3 days<br>NE3: 8 days | | | | 14,475 | 17,000 |
| Activity 3.2: Draft and development of the technical specifications and guidelines | IE1: 12 days<br>IE2: 5 days<br>IE3: 5 days<br>IE4: 22 days<br>NE1: 9 days<br>NE2: 4 days<br>NE3: 22 days | | | | 25,350 | 29,900 |
| Activity 3.3: Analyse socio-economic benefits of sustainable stormwater management and drainage systems | IE1: 7 days<br>IE2: 6 days<br>IE3: 4 days<br>IE4: 9 days<br>NE1: 7 days<br>NE2: 12 days<br>NE3: 9 days | | | | 16,250 | 19,100 |
| Activity 3.4: Develop guidelines and conduct stakeholder meetings | IE1: 9 days<br>IE2: 6 days<br>IE3: 4 days | | | | 17,950 | 21,200 |

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| | IE4: 9 days<br>NE1: 12 days<br>NE2: 12 days<br>NE3: 9 days | | | | | |
| **Output 4: Finalization of the document, draft GCF concept note, and capacity building programme** | ***43,400-49,925*** | *International travel and DSA for 3 experts + Domestic travel*<br>*USD **5,500*** | *Capacity building for 20 participants*<br>*USD **5,500*** | *Lumpsum for additional translation services*<br>*USD 725* | **55,125** | **61,650** |
| Activity 4.1: Finalize the documents | IE1: 10 days<br>IE2: 5 days<br>IE3: 4 days<br>IE4: 2 days<br>NE1: 10 days<br>NE2: 2 days<br>NE3: 2 days | | | | 11,325 | 13,150 |
| Activity 4.2: Draft GCF concept note | IE1: 10 days<br>IE2: 10 days<br>IE3: 7 days<br>IE4: 5 days<br>NE1: 10 days<br>NE2: 3 days<br>NE3: 5 days | | | | 16,500 | 18,950 |
| Activity 4.3: Translate documents into local language | IE1: 1 day<br>NE1: 1 day<br>NE3: 1 day | | | | 900 | 1,075 |
| Activity 4.4: Capacity building programme | IE1: 10 days<br>IE2: 10 days<br>IE3: 5 days | | | | 14,600 | 16,750 |

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| | IE4: 5 days<br>NE1: 3 days<br>NE2: 3 days<br>NE3: 7 days | | | | | |
| **Estimated costing for the entire Response Plan** | | | | | **188,075** | **215,000** |

The Response Plan is prepared when the world is still facing challenges regarding the global pandemic of COVID-19. All the travels and face to face meetings will be planned and undertaken after a detailed assessment of the risks due to COVID 19 and following the related advisory by the national and local government from the country where the project is located and the country where the implementer is located. This must be assured through a letter of undertaking provided by the authority of the entity requesting for travel and meetings before they are conducted.
In the scenario of lockdown and/or travel restrictions, there are uncertainties related to travel of the international consultants. To have the minimal impact of this risk to the timeline and workplan, the situation must be monitored closely, and alternate approaches may be suggested in discussion with the Maldives Government. In case alternate approaches are to be adopted, the budget will be revised accordingly with the revised plan, and reasonable additional activities may be suggested with the unspent budget. The revised plan will be agreed by CTCN and NDE before being adopted for implementation.

## 5. Profile and experience of experts

*Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan.*

| Experts required | Brief description of required profile |
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| Project Manager (IE1)<br>(International/ National expert) | The project manager shall have the following expertise and experience:<br>• Master's degree or above (or equivalent experience) in environmental/civil engineering, technology and/or project management, urban planning, climate finance, or an affiliated major<br>• Experience in leading and managing a project and a team of experts from different cultural backgrounds and fields of expertise<br>• At least 10 years of experience in projects on water management, urban planning, and other relevant sectors, as well as experience in working with governments including local/municipal authorities and agencies<br>• At least 5 references demonstrating experience in developing sustainable stormwater management and drainage systems (SuDS)<br>• Experience in organizing workshops and/or capacity-building trainings |

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| | • Previous experience in Maldives or other small islanded developing countries (SIDS) will be valued.<br>• Excellent written and communication skills in English are required. |
| Senior water infrastructure and drainage engineer (IE2) (International expert) | The expert in water infrastructure and drainage engineer shall have the following expertise and experience:<br>• Master's degree or above (or equivalent experience) in environmental science/engineering, civil engineering, hydraulics<br>• At least 8 years of experience in water management including engineering design and construction of storm water management and drainage systems<br>• At least 5 references demonstrating experience in stormwater management projects in developing countries<br>• Experience in urban water management and planning<br>• Previous experience in SIDS will be valued.<br>• Excellent written and communication skills in English are required. |
| Climate Finance Expert (IE3) (International expert) | The expert in finance shall have the following expertise and experience:<br>• Master's degree or above (or equivalent experience) in economics, environmental economics, climate finance or an affiliated major<br>• At least 8 years of experience in economic analysis and climate financing relevant to water infrastructure, and preparation of project concepts and supporting documents to access climate finance<br>• At least 2 references demonstrating experience in designing sustainable financing models for climate projects, including preparation of GCF concept notes<br>• Previous experience in SIDS will be valued<br>• Excellent written and communication skills in English are required |
| Modelling Expert (IE4) (International expert) | The expert in water management and modelling shall have the following expertise and experience:<br>• Master's degree or above (or equivalent experience) in environmental engineering, civil engineering, system engineering, and urban planning<br>• At least 5 years of experience in decision support tools for stormwater management and drainage systems, including integrated urban drainage water modelling<br>• At least 3 references demonstrating relevant experience in developing countries<br>• Experience in hydraulic modelling for drainage systems or infiltration techniques<br>• Previous experience in SIDS will be valued |

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| | • Excellent written and communication skills in English are required |
| Environment and Climate Expert (NE1)<br>(National expert) | The local coordination expert shall have the following expertise and experience:<br>• Master's degree or above (or equivalent experience) in environmental sciences, environmental engineering, technology and/or management, climate technology and/or management, or an affiliated major<br>• Experience in providing local coordination support to lead implementers on projects related to environment, water and/or climate issues, working with the NDE and/or local and national authorities on data collection and consultations<br>• At least 5 years of experience in the field of environment and water management in the Maldives as well as experience in working with governments including local/municipal authorities and agencies<br>• Excellent written and communication skills in Dhivehi and English are required<br>• It is expected that the local expert will be based in the Maldives (preferred) or with the availability to travel frequently and for long periods of time in the Maldives |
| Gender Expert (NE2)<br>(National expert) | The gender expert shall have the following expertise and experience:<br>• Bachelor's degree or above in social or natural sciences or another relevant discipline, preferably with a specialization in gender<br>• A minimum of five years' practical experience in the field of gender equality and gender mainstreaming<br>• Understanding and demonstrated ability of integrating gender considerations in community led water infrastructure interventions<br>• At least 2 references demonstrating experience of integrating gender considerations in community led water infrastructure interventions and/or local climate change adaptation responses<br>• Experience of gender analysis in the context of climate change risk assessments at urban/municipal levels in Maldives and other developing countries is preferred<br>• Excellent written and communication skills in Divehi and English are required<br>• It is expected that the gender expert will be based in Maldives (preferred) or with the availability to travel frequently and for long periods of time in Maldives |
| Water infrastructure and drainage engineer (NE3)<br>(National expert) | The expert in water infrastructure and drainage engineer shall have the following expertise and experience:<br>• Master's degree or above (or equivalent experience) in environmental science/engineering, civil engineering, hydraulics<br>• At least 5 years of experience in water management including engineering design and construction of storm |

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| | water management and drainage systems<br>• At least 2 references demonstrating experience in stormwater management projects in developing countries<br>• Experience in urban water management and planning<br>• Previous experience in SIDS will be valued<br>• Excellent written and communication skills in Divehi and excellent communications skills English are required<br>• It is expected that the expert will be based in the Maldives (preferred) or with the availability to travel frequently and for long periods of time in the Maldives |

**6. Intended contribution to impact over time**

*Please provide a brief description of the intended contribution to impact over time of the outcome and outputs provided by this technical assistance on resilience to climate change and/or carbon abatement. To the extent possible, please quantify the intended impact contribution, for example by indicated estimated number of people potentially impacted over time, GDP contribution of the focus sector, carbon emissions by the focus sector, etc. This intended contribution to impact is what will happen if the objective (as articulated in section 3) is met. Please ensure relevant complementarity with text in sections 7 to 12. (maximum 1250 characters including spaces)*

The outputs of the technical assistance will enable the country to develop guidance and build capacity for the design and implementation of sustainable storm water management systems. This will also enable to set standards for sustainable development and management of stormwater/flood management infrastructure in Maldives, which is expected to have a positive impact in reducing loss and damage from increased flooding, as well as additional co-benefits (e.g. increased availability of scarce water resources in the islands).
Furthermore, the output of this technical assistance is also expected to be used to leverage funds from financial mechanisms like GCF to scale up implementation of these systems in the country.

The possible quantification of intended impacts will be detailed in the impact description report under deliverable 1.

**7. Relevance to NDCs and other national priorities**

*Please identify relevance and contribution from the technical assistance to the Nationally Intended Contributions (NDC) and other relevant national prioritized efforts (TNAs, TAPs, NAPs, NAMAs, etc.). (maximum 2500 characters including spaces)*

The technical assistance will contribute to addressing the need to climate proof and build resilient infrastructure, addressing flooding problems which have been exacerbated by climate change, by contributing to the development of institutional capacity to design and implement sustainable stormwater management systems.

Maldives´updated Nationally Determined Contribution (NDC) 2020 emphasizes the importance of enhancing water security, including by building climate proof infrastructure and investing flood mitigation measures. Furthermore, a number of legislative, regulatory and planning instruments, including those indicated below, also underscore the need to build flood resilient island communities and the need to set standards for sustainable (climate proofed) storm water management systems.

- Maldives Nationally Determined Contribution 2020
- Maldives Climate Emergency Act
- Water Resource Protection and Management Regulation (2021 R-22) developed under the Water and Sewerage Act (8/2020)
- Strategic Action plan for water and sewerage (2020-2025).

**8. Linkages to relevant parallel on-going activities:**

*Please identify relevant previous and ongoing public and private sector initiatives, projects or programmes that the CTCN assistance will specifically build on and contribute to. To the extent possible, please add practical and operational details on the linkages between existing activities and the CTCN assistance. (maximum 2500 characters including spaces)*

This technical assistance will build on initial studies conducted under the GCF project "Supporting vulnerable communities in Maldives to manage climate change-induced water shortages", in particular on the studies conducted by the Ministry of Environment, Climate Change and Technology on measures to protect groundwater resources in the Maldives[2].

CTCN is also providing support to address climate change impacts on the availability of freshwater in the islands, through a technical assistance that aims to enhancing capacity and raising awareness of farming communities to increase water use efficiency for agriculture by piloting an infiltration gallery system in the HDh.Nolhivaranfaru Island.

**9. Anticipated follow up activities after this technical assistance is completed:**

*Please describe the expected future use of the outputs and deliveries produced by this technical assistance, after the CTCN implementation is completed, towards contributing to the anticipated impacts over time articulated in section 6. For example, what organizations or stakeholders will use the outputs of the technical assistance after it is completed, for what purpose, at what scale and scope the outputs and deliveries will be applied, when and what will be the next steps undertaken, etc. (maximum 2500 characters including spaces)*

Once the technical assistance is completed, the Department of Water and Sanitation will be able to procure directly the stormwater management solutions for three sites, using the technical specifications produced.

Furthermore, the national government, including the Ministry of Environment, Climate Change and Technology and its Department of Water and Sanitation, will be able to use key results from this technical assistance to inform the formulation and adoption of standards for sustainable stormwater systems, and will also have increased capacity of applying such standards and guidelines to other priority sites in the islands.

The draft GCF concept note to be developed is expected to provide a starting point for discussions with the GCF (e.g. with the Project Preparation Facility) to enable scaling up implementation of these systems in the islands so as to strengthen the resilience of stormwater management infrastructure.

The results of this technical assistance will also be archived for regional demonstration for other countries to replicate.

**10. Gender and co-benefits:**

| | |
|---|---|
| Imbedded in design of the activities: | *A gender mainstreaming analysis is mandatory to include for all technical assistances. A gender expert will be assigned to carry out an assessment and evaluation regarding gender mainstreaming during the implementation of the TA.*<br>*In addition, please describe all support to gender aspects, women's equality and other co-benefits embedded into the Response Plan (please include a reference to the actual activities and outputs as described in section 3).* |

[2] Ministry of Environment, (2021). A Guide to Groundwater Protection & Improvement Measures in Maldives. Male', Maldives

| | |
|---|---|
| | Most activities of the technical assistance are designed with an imbedded intention of gender mainstreaming and providing other co-benefits to vulnerable groups. The lead implementer will be requested to assign a gender expert to conduct analysis of gender dimensions relevant to the project and to the monitoring and evaluation of gender mainstreaming during the implementation of the TA.<br><br>Attention will be given to identifying opportunities to increase gender equality, including ensuring adequate representation of women in the technical training programme to be rolled out, and ensuring that the gender aspects of the project are addressed during consultations, discussing relevant implications of the design and selection of technology solutions as relevant. Due attention will also be given in the organization of the consultation meetings planned under the TA, so and that there is unrestricted access and participation in the project. |
| Gender and co-benefits intended as result of the activities: | *Please describe all gender aspects, women's equality and other co-benefits expected as a result of the CTCN technical assistance.*<br><br>Specific activities will be looked as part of the project, such as:<br>• Analysis of the socio-economic benefits of the various infiltration-based drainage methods using a gender mainstreaming approach in climate disaster risk management<br>• Capacity building activities aiming at increased participation of women technical staff in the training programme.<br>• Recommendations on mainstreaming gender into applicable regulatory and planning frameworks and technical guidelines for sustainable stormwater management. |

**11. Main in-country stakeholders in implementation of the technical assistance activities:**

*Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.*

| In country stakeholder | Role in implementation of the technical assistance |
|---|---|
| *National Designated Entity*<br>Climate Change Department, Ministry of Environment, Climate Change and Technology (MECCT) | *Overall oversight of the TA*<br>*Uptake of the Technical Specifications and Guidelines developed to inform standards to be adopted for Sustainable Water Management Systems in the Maldives* |
| *Project Proponent*<br>Water and Sanitation Department, Ministry of Environment, Climate Change and Technology (MECCT) | *Day to day management and coordination of the TA. Facilitate stakeholder consultations*<br>*Select (in consultation with NDE) participants in the capacity building programme.* |
| *Ministry of National Planning, Housing and Infrastructure (MNHPI)* | *Technical advice and support to the NDE and Project Proponent.*<br>*Supply bathymetry data, and support the data collection efforts and analysis* |

| | |
|---|---|
| | *Review the GCF concept note* |
| *Utility Regulatory Agency (URA)* | *Supply of existing data as appropriate; participate in consultations as relevant* |
| *Road Development Corporation (RDC)* | *Supply of existing data as appropriate; participate in consultations as relevant* |
| *Maldives Transport and Contracting Company (MTCC)* | *Supply of existing data as appropriate; participate in consultations as relevant* |
| *Local Government Agency (LGA)* | *Supply of existing data as appropriate; participate in consultations as relevant* |
| *Community members for the 3 selected sites* | *Collaborate in data gathering efforts and other TA activities, and participate in consultations as relevant* |
| *Other line ministries and stakeholders* | *Participate in national consultations as appropriate* |

## 12. SDG Contributions:

*Instructions: Please complete the grey section below for **a maximum of three SDGs** that will be advanced through this TA. A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/.*

| Goal | Sustainable Development Goal | Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs) |
|---|---|---|
| 1 | End poverty in all its forms everywhere | |
| 2 | End hunger, achieve food security and improved nutrition, and promote sustainable agriculture | |
| 3 | Ensure healthy lives and promote well-being for all at all ages | |
| 4 | Ensure inclusive and equitable quality education and promote life-long learning opportunities for all | |
| 5 | Achieve gender equality and empower all women and girls | |
| 6 | Ensure availability and sustainable management of water and sanitation for all | This TA will contribute to strengthening water management, by increasing institutional capacity to design and implement sustainable stormwater management systems |
| 7 | Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7) | |
| | 7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services | |
| | 7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix | |
| | 7.3 - By 2030, double the global rate of improvement in energy efficiency | |
| | 7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology | |
| | 7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support | |
| 8 | Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all | |
| 9 | Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation | |
| 10 | Reduce inequality within and among countries | |
| 11 | Make cities and human settlements inclusive, safe, resilient and sustainable | This TA will assist cities to climate proof stormwater management systems/climate proof their infrastructure, as well as build relevant technical capacity, increasing urban resilience. |

| | | |
|---|---|---|
| 12 | Ensure sustainable consumption and production patterns | |
| 13 | Take urgent action to combat climate change and its impacts | *All TAs should indicate relevance to Goal 13 and at least one target below (13.1 to 13.b).* |
| | 13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries | – The TA will provide tools that can contribute to reducing impacts from flooding caused by extreme weather events |
| | 13.2 - Integrate climate change measures into national policies, strategies and planning | – The TA will generate planning tools to climate proof water infrastructure |
| | 13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning | – This TA will help strengthen institutional technical capacity to develop and implement sustainable stormwater management systems that will help address increasing flooding problems in urban areas |
| | 13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible | |
| | 13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities | |
| 14 | Conserve and sustainably use the oceans, seas and marine resources for sustainable development | |
| 15 | Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss | |
| 16 | Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels | |
| 17 | Strengthen the means of implementation and revitalize the global partnership for sustainable development | |

## 13. Classification of technical assistance:

*Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.*

| *Please tick off the relevant boxes below* | *Primary* | *Secondary* |
|---|---|---|
| ☐ 1. Decision-making tools and/or information provision | ☐ | ☐ |
| ☐ 2. Sectoral roadmaps and strategies | ☐ | ☐ |
| ☐ 3. Recommendations for law, policy and regulations | ☐ | ☒ |
| ☐ 4. Financing facilitation | ☐ | ☒ |
| ☐ 5. Private sector engagement and market creation | ☐ | ☐ |
| ☐ 6. Research and development of technologies | ☐ | ☐ |
| ☐ 7. Feasibility of technology options | ☒ | ☐ |
| ☐ 8. Piloting and deployment of technologies in local conditions | ☐ | ☐ |
| ☐ 9. Technology identification and prioritisation | ☐ | ☐ |

*Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.*

## 14. Monitoring and Evaluation process

*Upon contracting of the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-*

*bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) NDE about overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance; and (iii) the CTCN Director about timeliness and appropriateness of the delivery of the activities and outputs.*