ADAPTATION FUND

UN environment programme | CTCN CLIMATE TECHNOLOGY CENTRE & NETWORK

Adaptation Fund Climate Innovation Accelerator

Project Concept Note - Technical Assistance Response Plan

Country	**Maldives**
Request ID#	**AF-2021000038**
Title	Establishment of a skimming well gallery system for agricultural use in HDh.Nolhivaranfaru of Maldives
NDE	Mareer Mohamed Husny Assistant Director Climate Change Department, Ministry of Environment, Climate Change and Technology mareer.husny@environment.gov.mv; climate@environment.gov.mv Handuvaree Hingun, Maafannu, Male, 20392, Maldives
Proponent	Mohamed Musthafa Director General Water and Sanitation Department, Ministry of Environment, Climate Change and Technology mohamed.musthafa@environment.gov.mv Handuvaree Hingun, Maafannu, Male, 20392, Maldives

Summary of the CTCN technical assistance

The summary should provide a brief description of the problem (barrier to climate technology deployment) and how the technical assistance will address it (brief summary of outputs and activities), highlighting the innovative adaptation technology/practices aspects of the proposed response. Please also briefly indicate national actors involved and the anticipated timeline. Please note this summary will be used for public communication purposes so it is important that it is well written. (maximum 1250 characters including spaces)

Water scarcity is one of the biggest challenges in Maldives arising from climate change. Excessive groundwater extraction has led to saline water intrusion and reduction of the efficiency of its natural recharge processes. This technical assistance (TA) aims to deploy an infiltration gallery system as an efficient, sustainable method for groundwater extraction for agriculture in HDh.Nolhivaranfaru Island.

Site selection for installing the system in HDh.Nolhivaranfaru Island will be conducted through stakeholder consultations and preliminary investigation. The infiltration gallery system will be then designed and installed at selected site. For enhancing capacity and raising awareness of farming communities at selected site, recommendations to increase water use efficiency for agriculture, guide materials for sustainable agricultural practices and a manual for management of the system and monitoring of groundwater quality will be provided along with a training of trainer programme. Through this TA, sustainable groundwater extraction system for agricultural practices will be established, and unpolluted groundwater aquifers will be protected in HDh.Nolhivaranfaru Island.

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Agreement:

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

National Designated Entity to the UNFCCC Technology Mechanism
Name: Mareer Mohamed Husny
Title: Assistant Director
Date: 24 June 2022

Signature: 

Proponent (signature of the Proponent is optional)
Name: Mohamed Musthafa
Title: Director General
Date: 24 June 2022

Signature: 

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Rose Mwebaza
Title: CTCN Director
Date: 28-06-2021
Signature: 

1. Background and context:

Please provide a brief description of the background and context for the CTCN Response Plan. Please include national and sectoral information using recognized and publicly available sources. (maximum 2500 characters including spaces)

Water scarcity is one of the biggest challenges in Maldives arising from climate change. Freshwater is the most important water resource in the country; however, it's quality and quantity are highly affected by climate variations and human activities such as urbanisation of the country and water use for agriculture. Moreover, intrusion of saline water deteriorates the quality of freshwater resources. Existing poor agricultural practices, such as use of dug wells as fertiliser mixing containers which causes leaching of fertilisers into freshwater resources, further intensifies this problem. Depletion of freshwater resources due to uncontrolled usage in the absence of appropriate means to regulate results in the threats to groundwater aquifers on the islands of Maldives.

Excessive groundwater extraction has led to saline water intrusion and reduction of the efficiency of its natural recharge processes. In particular, during drought season, over-pumping can alter the size of the groundwater aquifer and limit recovery to its former size. Therefore, it is vital to develop and deploy an efficient method for groundwater extraction in order to ensure sustainable use of limited water resources with minimum impact on the aquifers in Maldives.

The island of Nolhivaranfaru is located in the Haa Dhaalu Administrative Atoll with the population of 1,081 people according to the 2014 Census. The island is 3.55km long and 1.1km wide, and has an area of 171 Hectares. The vegetation covers about 70% of the island's surface whereas around 4% of the land is used for farming. The farms are located around the middle of the island, to the south of the habituated area of the island and to the north of most of the vegetation. The construction of the sewerage network in the island has been completed and will be operational soon. For now, septic tanks are still widely used, and the island does not have a proper network for water supply.

There are approximately 103 plots (with an area of 5,000 square feet each) registered at the Island Council to be used for farming purposes. Among them, 93 plots are being used for farming, extracting groundwater for irrigation. While the size of the plots given to farmers are the same, amount of groundwater used for irrigation varies depending on the scale of farming (e.g., small scale farms: 16 litres daily and normal scale farms: up to 2,160 litres daily). It was estimated that 58,619 litres of groundwater were used daily by 93 farming plots.

2. Problem statement:

Founded on the national and sectoral context as detailed in the section above, please include a brief problem statement clarifying the main problems and barriers for climate change mitigation and/or adaptation in terms of climate technologies that the CTCN Response Plan will address and overcome. (maximum 1250 characters including spaces)

Since the current approach used in sourcing water for irrigation is unsustainable, there have been a number of interventions to promote sustainable groundwater use in small scale farming. In most

cases, groundwater is extracted through jet (petrol) pumps for irrigation, and such system threatens the thin groundwater aquifer of the island which replenishes after rainfall. Moreover, although there have been some works underway to establish such system, it is not operationalised and neither practiced by farming communities.

It is important to install and demonstrate an effective technology (e.g., avoiding using jet or heavy-duty pumps to extract groundwater) which can facilitate sustainable groundwater extraction and management among small scale farmers of the island. With this, replication of the technology to other islands which are facing the similar issues in Maldives is to be taken into account.

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.)

Objective: *Please provide a one sentence description of the Objective of the technical assistance. The objective of the CTCN technical assistance reflects what the assistance aims to produce and impact.*

Design and installation of an infiltration gallery system for groundwater extraction to ensure sustainable use of limited water resources with minimum impact on the aquifers in HDh.Nolhivaranfaru Island

Outcome: *(Guidance: The Outcome articulates changes in the institutional and behavioural capacities for climate technology development or deployment. Activities and Outputs contribute to the Outcome but the Outcome is not within the direct control of the CTCN activities). (maximum 400 characters including spaces)*

Sustainable water supply for irrigation in agriculture would be established, and unpolluted groundwater aquifers would be protected in HDh.Nolhivaranfaru Island. Moreover, capacity and knowledge of farming communities in the Island and other stakeholders on sustainable agricultural practices and water use efficiency for agriculture would be strengthened, which would contribute to increasing the capacity of climate change adaptation in Maldives.

	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Output 1: 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 (TA). i) A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan developed. The detailed work plan and budget must be based directly on this Response Plan; ii) Based on the work plan, a monitoring and evaluation (M&E) plan with specific, measurable, achievable, relevant and time-bound indicators provided and used to																		

monitor and evaluate the timeliness and appropriateness of the implementation (a template will be provided). The M&E plan should apply selected indicators from the technical assistance closure report template and enable the lead implementer to complete the technical assistance closure report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan); iii) Impact statement formulated at the beginning of the technical assistance and updated/revised once the technical assistance is fully delivered (a template will be provided); and iv) A technical assistance closure report completed at the end of the technical assistance (a template will be provided).																			
Deliverables 1: i) Detailed work plan ii) Monitoring & evaluation (M&E) plan and impact statement iii) Technical assistance closure report																			
Output 2: Site selection for installing the infiltration gallery system in HDh.Nolhivaranfaru Island through stakeholder consultations and preliminary investigation																			
Activity 2.1: A kick-off meeting and stakeholder consultations A kick-off meeting and consultations with stakeholders from line Ministries, Island/Atoll Councils as well as farming communities (e.g., farmland owner, Women's Development Committee (WDC), etc.) in HDh.Nolhivaranfaru Island will be carried out (in-person and/or online)[1]. Through this activity, the lead implementer will understand water resources as well as ongoing issues related to water supply for																			

[1] If the border lockdown is continued due to the COVID-19 pandemic, the lead implementer will take into account conducting the kick-off meeting and stakeholder consultations on an online basis with support from the national expert employed for this TA and the proponent.

farming in the island.																		
Activity 2.2: Organisation of the Project Steering Committee Project Steering Committee of key stakeholders (up to 10 persons) will be created. The Committee shall maintain a gender balance and an adequate representation of vulnerable groups. It will provide project overview and facilitative guidance at different stages of activities in this TA. For this purpose, the members of the Committee should have the capacity to take key decisions with regards to the design and installation of the infiltration gallery system in HDh.Nolhivaranfaru Island.																		
Activity 2.3: Preliminary investigation in HDh.Nolhivaranfaru Island and similar islands in Maldives, and site visit The lead implementer will carry out literature review and analysis to gather at least (but not limited to) the following information: • Climate change impact on crop cultivation and production in HDh.Nolhivaranfaru Island and similar islands in Maldives • Status of the land-use in HDh.Nolhivaranfaru Island and similar islands in Maldives • Water resources for agriculture in HDh.Nolhivaranfaru Island and similar islands in Maldives • Potential water pollution sources in HDh.Nolhivaranfaru Island and similar islands in Maldives • Existing technologies applied for irrigation in HDh.Nolhivaranfaru Island and similar islands in Maldives • A baseline analysis on the infiltration gallery system and the potential for its replication in HDh.Nolhivaranfaru Island and similar islands in Maldives Based on such information, potential areas for installation of the infiltration gallery system in the island will be listed and consulted with the NDE of Maldives and the																		

proponent (Water and Sanitation Department, Ministry of Environment, Climate Change and Technology) to prioritise them. During Activity 2.1, the lead implementer with support from the national expert (engineer) and the proponent will visit prioritised potential areas for water quality assessment. In-situ testing (e.g., pH-Eh, conductivity, etc.) and water sampling will be conducted in the areas, and hydro-geological survey will be carried out. Specific focus will be given to obtain the impacts of vertical variation of the aquifer due to the tide. With this, current status of groundwater aquifer volume will be identified based on the available data[2] and if required by applying a proper testing method (e.g., pumping out testing method, three-dimensional resistivity and induced polarisation imaging technique, etc.), and projected increase of groundwater volume due to installation of the infiltration gallery system will be estimated. Note: During the testing procedure, measures must be taken to avoid any disruption to water usage in the island.																			
Activity 2.4: Selection of the site to install the infiltration gallery system Based on results of water quality assessment and hydro-geological survey, 2-3 potential areas will be selected by applying a proper decision-making tool (e.g., multicriteria analysis). It will be required to consider that the short-listed potential areas are away from water pollution sources. The Project Steering Committee will be requested to participate in the virtual meeting to select the site for installing the infiltration gallery system in HDh.Nolhivaranfaru Island. In the meeting, the lead implementer will also provide a concept design of the infiltration gallery system on the short-listed potential areas.																			
Deliverables 2: i) Report on the kick-off meeting and stakeholder consultations																			

[2] https://www.environment.gov.mv/v2/en/download/10708

ii) Detailed description of the Project Steering Committee, with name and contact details of the members, respective institutions, gender, etc. iii) Report on the preliminary investigation in HDh.Nolhivaranfaru Island and similar islands in Maldives, and the site visit iv) Report on the concept options and preferable concept design on the selection of the site to install the infiltration gallery system in HDh.Nolhivaranfaru Island																			
Output 3: Design of the infiltration gallery system at selected site in HDh.Nolhivaranfaru Island																			
Activity 3.1: Environmental assessment of the infiltration gallery system at selected site The lead implementer with support from the national expert and the proponent will conduct an environmental assessment as per the Environment Impact Assessment regulations of the Government of Maldives prior to establishment of the infiltration gallery system at selected site. The anticipated biophysical, social, and other impacts caused by installing the system will be identified and evaluated by using a proper method. The results of the assessment will be provided to the NDE of Maldives and the proponent, and further discussion will be proceeded with if needed.																			
Activity 3.2: Detailed engineering design of the infiltration gallery system The lead implementer will investigate case studies regarding the design and installation of the infiltration gallery system. Based on findings from investigation and results of Activity 2.3 and 3.1, detailed engineering design of the system to be installed at selected site will be made. At least (but not limited to) the following matters should be produced in conducting this activity: • Blueprint of the infiltration gallery system • Detailed information on the capacity of the infiltration gallery system • Anticipated implementation period of the infiltration gallery system • Anticipated beneficiaries (including the number of households and																			

communities) of the infiltration gallery system The national expert will actively involve, providing practical information and/or field data required during the period of designing the system.					■	■	■											
Activity 3.3: Organisation of a meeting with the Project Steering Committee The results of Activity 3.1 and 3.2 will be shared with the Project Steering Committee in a virtual meeting. The lead implementer will present the designed infiltration gallery system and the anticipated impact of its installation on selected site. Depending on feedbacks from the Project Steering Committee, the lead implementer will be requested to amend the detailed engineering design of the system.							■											
Deliverables 3: i) Report on the environmental assessment of the infiltration gallery system at selected site ii) Detailed engineering design of the infiltration gallery system iii) Minute of the Project Steering Committee meeting with a list of participants disaggregated by gender, materials used, and summary of the discussions held					■		■											
Output 4: Installation and monitoring of the infiltration gallery system at selected site in HDh.Nolhivaranfaru Island								■	■	■	■	■	■	■				
Activity 4.1: Installation of the infiltration gallery system at selected site Based on the design and feedback received from the Project Steering Committee, the lead implementer will install the infiltration gallery system at selected site. The lead implementer will be requested to report the progress of the system installation at selected site regularly to the CTCN as well as the NDE of Maldives and the proponent[3].								■	■	■	■	■						

[3] The frequency of reporting to the CTCN as well as the NDE of Maldives and the proponent will be further decided later after the detailed engineering design of the infiltration gallery system (Activity 3.2) is completed.

Activity 4.2: Monitoring of the infiltration gallery system and groundwater quality at selected site After installation of the infiltration gallery system, the lead implementer with support from the national expert will monitor the system on a regular basis[4]. With this, the quality of groundwater gathered in the system as well as in unpolluted groundwater aquifers nearby the system will be also monitored on a regular basis in order to check whether any pollution caused by the system occurs in groundwater at selected site[5].																		
Activity 4.3: Organisation of a meeting with the Project Steering Committee The results of Activity 4.1 and 4.2 will be shared with the Project Steering Committee in a virtual meeting. The lead implementer will present the process of installing the infiltration gallery system and its current operational status as well as show the results of monitoring the system and the quality of groundwater (in the system and in the unpolluted groundwater aquifers) at selected site.																		
Deliverables 4: i) Installation, testing and commissioning of the infiltration gallery system at selected site ii) Report on the monitoring of the infiltration gallery system and groundwater quality at selected site iii) Minute of the Project Steering Committee with a list of participants disaggregated by gender, materials used, and summary of the discussions held																		
Output 5: Capacity building and awareness-raising to increase water use efficiency for agriculture as well as to manage the infiltration gallery system and monitor groundwater quality																		

[4] The frequency of monitoring the infiltration gallery system will be further discussed with the NDE of Maldives and the proponent in consideration with farming activities at selected site.

[5] The frequency of monitoring groundwater quality will be further discussed with the NDE of Maldives and the proponent in consideration with farming activities at selected site.

Activity 5.1: Recommendations to increase water use efficiency for agriculture at selected site The lead implementer with support from the national expert will carry out field survey and interview with farming communities to identify current water consumption pattern for agriculture at selected site. Based on results of the survey and the interview, recommendations to increase water use efficiency for agriculture will be provided. Key findings from this activity will be used in developing presentation materials for a training workshop (Activity 5.4).																		
Activity 5.2: Development of guide materials for sustainable agricultural practices The lead implementer will investigate different cases of the sustainable agricultural practices and associated technologies in consideration with the types of crops cultivated and produced in HDh.Nolhivaranfaru Island. The results of investigation will be gathered for publishing guide materials (e.g., leaflets, handouts, flyers, brochures, videos, etc.) which will be shared with farming communities at selected site. The lead implementer will be requested to provide the materials in both English and Maldivian. Key findings from this activity will be used in developing presentation materials for a training workshop (Activity 5.4).																		
Activity 5.3: Development of a manual for management of the infiltration gallery system and monitoring of groundwater quality at selected site A manual that guides the operation & maintenance (O&M) process of the infiltration gallery system and the way of monitoring quality of groundwater (in the system and in the unpolluted groundwater aquifers) will be documented and shared with farming communities at selected site. The lead implementer will be requested to provide the manual in both English and Maldivian in consideration with the level of technical understanding of the farming communities. Key information of the manual will be summarised and presented to farming communities during a training workshop (Activity 5.4).																		

Activity 5.4: Organisation of a 2-day training of trainer programme The lead implementer with support from the national expert will organise a 2-day training of trainer programme. The infiltration gallery system and its O&M process will be introduced to the participants in the programme. Moreover, the lead implementer will elaborate not only the way of monitoring quality of groundwater (in the system and in the unpolluted groundwater aquifers) but also associated tools/equipment. Last but not least, recommendations to increase water use efficiency for agriculture provided in Activity 5.1 and some of the sustainable agricultural practices and associated technologies identified in Activity 5.2 will be also presented to participants in the programme. After this programme, satisfaction survey from participants will be conducted to identify the level of their understanding regarding the infiltration gallery system, groundwater quality monitoring, water use efficiency for agriculture and sustainable agricultural practices.																	
Deliverables 5: i) Report on recommendations to increase water use efficiency for agriculture at selected site ii) Guide materials (e.g., leaflets, handouts, flyers, brochures, videos, etc.) for sustainable agricultural practices (in English and Maldivian) iii) A manual for management of the infiltration gallery system and monitoring of groundwater quality at selected site (in English and Maldivian) iv) Materials for training of trainer programme (e.g., presentations, satisfaction survey template, etc.) v) Report on the 2-day training of trainer programme (including results of the satisfaction survey) with list of participants disaggregated by gender and summary of the discussions held Note: All awareness and training materials, including the manual, are to be disseminated after the approval of the proponent.																	

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*	
					Minimum	**Maximum**
Output 1: Development of implementation planning and communication documents					***5,300***	***8,300***
Activity 1: i) Detailed work plan, ii) M&E plan and impact statement, iii) Technical assistance closure report	*I1: 3 days* *I2: 3 days* *I3: 3 days* *N1: 3 days* *N2: 3 days* *N3: 3 days*				*5,300*	*8,300*
Output 2: Site selection for installing the infiltration gallery system in					***45,200***	***57,200***

HDh.Nolhivaranfaru Island through stakeholder consultations and preliminary investigation						
Activity 2.1: A kick-off meeting and stakeholder consultations	*I1: 5 days* *I2: 6 days* *I3: 6 days* *N1: 6 days* *N2: 5 days* *N3: 6 days*	*[International travel]* *3 international experts for the duration of 6 days each for the kick-off meeting and stakeholder consultations (Activity 2.1) as well as the site visit (Activity 2.3)*	*Kick-off meeting, 10 participants (including women's representative), 1 day* *Stakeholder consultations, 15 participants (including women's representative), 1 day*		*19,700*	*22,700*
Activity 2.2: Organisation of the Project Steering Committee	*I1: 2 days* *I2: 2 days* *I3: 2 days* *N1: 2 days* *N2: 2 days* *N3: 2 days*				*3,000*	*6,000*
Activity 2.3: Preliminary investigation in HDh.Nolhivaranfaru Island and similar islands in Maldives, and site visit	*I1: 5 days* *I2: 10 days* *I3: 5 days* *N1: 10 days* *N2: 2 days* *N3: 15 days*	*[Domestic travel]* *3 international experts and 2 national experts for the duration of 2 days each for the site visit*		*Equipment for assessing water quality and groundwater aquifer volume*	*15,300*	*18,300*

Activity 2.4: Selection of the site to install the infiltration gallery system	*I1: 5 days* *I2: 5 days* *N1: 5 days* *N2: 2 days* *N3: 5 days*		*Project Steering Committee (online), 10 participants (including women's representative), 1 day*		*7,200*	*10,200*
Output 3: Design of the infiltration gallery system at selected site in HDh.Nolhivaranfaru Island					***45,700***	***54,700***
Activity 3.1: Environmental assessment of the infiltration gallery system at selected site	*I1: 5 days* *I2: 5 days* *I3: 5 days* *N1: 15 days* *N2: 5 days* *N3: 10 days*	*[International travel]* *2 international experts for the duration of 4 days each for the environmental assessment* *[Domestic travel]* *2 international experts and 1 national expert for the duration of 2 days each for the environmental assessment*		*Equipment for the environmental assessment*	*18,400*	*21,400*
Activity 3.2: Detailed engineering design of the infiltration gallery	*I1: 10 days* *I2: 25 days* *I3: 5 days* *N2: 5 days*	*[Domestic travel]* *1 national expert for the duration of 2 days for gathering the practical*			*21,800*	*24,800*

system	*N3: 15 days*	*information and/or field data (if required)*				
Activity 3.3: Organisation of a meeting with the Project Steering Committee	*I1: 4 days* *I2: 4 days* *N1: 4 days* *N2: 2 days* *N3: 4 days*		*Project Steering Committee (online), 10 participants (including women's representative), 1 day*		*5,500*	*8,500*
Output 4: Installation and monitoring of the infiltration gallery system at selected site in HDh.Nolhivaranfaru Island					***60,400***	***69,400***
Activity 4.1: Installation of the infiltration gallery system at selected site	*I1: 10 days* *I2: 20 days* *N3: 20 days*	*[International travel]* *1 international expert for the duration of 6 days for installing the infiltration gallery system (2 times)* *[Domestic travel]* *1 international expert and 1 national expert for the duration of 4 days each for installing the infiltration gallery system (2 times)*		*A full package of the infiltration gallery system*	*46,200*	*49,200*

Activity 4.2: Monitoring of the infiltration gallery system and groundwater quality at selected site	*I1: 5 days* *I2: 10 days* *N3: 15 days*	*[Domestic travel]* *1 national expert for the duration of 1 day for monitoring the infiltration gallery system and groundwater quality (frequency of monitoring: to be discussed)*		*Equipment for monitoring the infiltration gallery system and groundwater quality*	*9,900*	*12,900*
Activity 4.3: Organisation of a meeting with the Project Steering Committee	*I1: 4 days* *I2: 4 days* *N2: 2 days* *N3: 4 days*		*Project Steering Committee (online), 10 participants (including women's representative), 1 day*		*4,300*	*7,300*
Output 5: Capacity building and awareness-raising to increase water use efficiency for agriculture as well as to manage the infiltration gallery system and monitor groundwater quality					***46,400***	***58,400***
Activity 5.1: Recommendations to increase water use efficiency for agriculture at selected	*I1: 5 days* *I2: 5 days* *I3: 5 days* *N1: 5 days* *N3: 10 days*	*[Domestic travel]* *1 national expert for the duration of 2 days for identifying water consumption pattern for*			*9,900*	*12,900*

site		*agriculture at selected site (field survey and interview)*				
Activity 5.2: Development of guide materials for sustainable agricultural practices	*I1: 5 days* *I3: 10 days* *N3: 5 days*				*6,900*	*9,900*
Activity 5.3: Development of a manual for management of the infiltration gallery system and monitoring of groundwater quality at selected site	*I1: 5 days* *I2: 15 days* *N3: 5 days*				*8,700*	*11,700*
Activity 5.4: Organisation of a 2-day training of trainer programme	*I1: 5 days* *I2: 10 days* *I3: 10 days* *N2: 5 days* *N3: 10 days*	*[International travel]* *3 international experts for the duration of 3 days each for the training of trainer programme* *[Domestic travel]* *3 international experts and 2 national experts for the duration of 2 days each for the training of trainer programme*	*Training of trainer programme, 20 participants (including women's representative), 2 days*		*20,900*	*23,900*

Estimated range of costing for the entire Response Plan					***203,000***	***248,000***

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
Please use the same titles for all experts as applied in section 4.	*Please provide a short description of expertise and experience needed (education, sectors of expertise, years of experience, country experience, language requirements, etc.).*
Project Manager (I1) (International expert)	The project manager shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in agricultural engineering, technology and/or management or an affiliated major • Experience in leading and managing a project and a team of experts from different cultural background and fields of expertise • At least 10 years of experience in designing and/or deploying climate technologies in agriculture sector • At least 5 references demonstrating experience in the design and installation of the infiltration gallery system in developing countries • Experience in organising workshops and/or capacity building trainings • Previous experience in Maldives will be valued. • Excellent written and communication skills in English are required.
Expert in infiltration gallery system design (I2) (International expert)	The expert in infiltration gallery system design shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in agricultural engineering and/or technology or an affiliated major • At least 8 years of experience in designing and installing the infiltration gallery system • At least 5 references demonstrating experience in the design and installation of the infiltration gallery system in developing countries • Experience in organising workshops and/or capacity building trainings • Previous experience in Maldives will be valued. • Excellent written and communication skills in English are required.

Expert in agriculture technology (I3) (International expert)	The expert in agriculture technology shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in agricultural engineering and/or technology, climate technology or an affiliated major • At least 5 years of experience in identifying, evaluating, and/or deploying climate technologies in agriculture sector • At least 3 references demonstrating experience in the implementation of climate technologies in agriculture sector in developing countries • Experience in organising workshops and/or capacity building trainings • Previous experience in Maldives will be valued. • Excellent written and communication skills in English are required.
Environmental expert (N1) (National expert)	The environmental expert shall have the following expertise and experience: • Bachelor's degree or above (or equivalent experience) in environmental management assessment and/or science or an affiliated major • At least 5 years of experience in conducting IEE/EIA/EMP/ESMP in agriculture/water sector or any relevant area • Registered EIA consultant at Environmental Protection Agency of Maldives • Excellent written and communication skills in Maldivian and English are required. • It is expected that the environmental expert will be based in Maldives or with the availability to travel frequently and for long periods of time in Maldives. .
Gender expert (N2) (National expert)	The gender expert shall have the following expertise and experience: • Bachelor's degree or above (or equivalent experience) in social science or an affiliated major • At least 5 years of experience in gender studies and/or management of equality policies • At least 2 references demonstrating experience in gender studies in environment/livelihood/water sector • Excellent written and communication skills in Maldivian and English are required. • It is expected that the gender expert will be based in Maldives or with the availability to travel frequently and for long periods of time in Maldives.
Engineer (agriculture, irrigation, water resources) (N3) (National expert)	The engineer (agriculture, irrigation, water resources) shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in agricultural engineering, technology and/or management or an affiliated major

	• At least 8 years of experience in the field of agriculture and water resources in Maldives • Excellent written and communication skills in Maldivian and English are required. • It is expected that the engineer will be based in Maldives or with the availability to travel frequently and for long periods of time in 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)

According to the Nationally Determined Contribution (2020), agriculture in Maldives is limited because of the size of the islands, poor soil conditions and limited water resources. Despite this, agriculture has provided economic and social welfare in Maldives and contributed to food security in the country. Findings from the TA would support the country to promote sustainable groundwater extraction and management for agricultural practices in HDh.Nolhivaranfaru Island. In particular, by establishing and operating the infiltration gallery system, it is expected that unpolluted groundwater aquifers would be protected in the island. Moreover, capacity and knowledge of farming communities in the island and agriculture-related stakeholders on sustainable agricultural practices and water use efficiency for agriculture would be strengthened. Based on findings from the TA, it is also expected that point groundwater extraction methods currently used in other islands could be replaced with the proposed infiltration gallery system, which would contribute to increasing the capacity of climate resilience with sustainable water supply for agriculture in Maldives.

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 TA is in line with national strategies and plans of Maldives for climate change adaptation.

- **Nationally Determined Contribution (2020):** The Maldives enhancement adaptation efforts
  - **Enhancing agriculture and food security (page 13):** Promote research and development focusing on climate smart technologies and practices to address challenges facing the sector due to climate variabilities, seasonal changes and extreme events
  - **Enhancing water security (page 15):** Implementation of cost-effective Integrated Water Resource Management (IWRM) systems to cater for the water needs of the entire population to reduce the risk of water shortages during dry seasons

- **Climate Change Policy Framework (2015):** 6. Policy goals, objectives and strategies - 6.2 Objectives and strategies - 6.2.3 Adaptation and opportunities
  - **Strategy 5 (page 28):** Develop mechanisms for the adoption of sustainable adaptation technologies that are locally and traditionally appropriate
  - **Strategy 10 (page 29)** Enhance and expand water resource storage capacity in island communities

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)

Specific baseline study of groundwater resources has been carried out in 13 islands of Maldives in order to identify their current conditions. From this study, the following results have been obtained:

• Mapping the freshwater resources in the islands
• Assessing the physiochemical and biological qualities of the aquifers
• Establishing sustainable groundwater yields
• Identifying details on major groundwater uses in the islands including agriculture

Based on findings from this study and consultation among the Ministries, HDh.Nolhivaranfaru Island has been identified as an island where agriculture is moderately practiced as well as identified as a potential pilot site to explore a new, sustainable, efficient technology to overcome limited water resources of the country. The TA will be a follow-up project of this study, conducting a pilot test to identify and assess the efficiency of the sustainable groundwater extraction system for agricultural practices 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 TA is completed, farming communities at selected site with support from the local government could use the sustainable groundwater extraction system for crop cultivation and production. They could operate and maintain the system by themselves by using the manual provided through the TA. Moreover, national government, including the Ministry of Environment, Climate Change and Technology and the Ministry of Fisheries, Marine Resources and Agriculture, could develop and implement a programme/project to replicate the system to other islands in Maldives

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.*

	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). Most activities of the TA 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 the monitoring and evaluation of gender mainstreaming during the implementation of the TA.
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.* Significant income for women in Maldives, including HDh.Nolhivaranfaru Island, comes from agricultural sector. The TA would contribute to settling sustainable farming in the island and increasing crop productivity by providing groundwater for irrigation in sustainable, efficient way to farming communities, which would also increase opportunities of women engagement and their empowerment in food production.

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**
Climate Change Department, Ministry of Environment, Climate Change and Technology *(National Designated Entity; Designated Authority)*	- Support coordination of the TA and facilitation of stakeholder engagement - Provide overall feedback to the CTCN and the lead implementer during the implementation of the TA
Water and Sanitation Department, Ministry of Environment, Climate Change and Technology *(Proponent)*	- Support coordination of the TA and facilitation of stakeholder engagement - Provide feedback (practical and technical components) to the CTCN and the lead implementer during the implementation of the TA - Support access to baseline information and associated data during the implementation of the TA
Utility Regulatory Authority	- Ensure activities of the TA meet existing regulations related to water supply and management - Support facilitation of necessary approvals required to implement the TA
Environmental Protection Agency	- Ensure activities of the TA meet existing groundwater protection and water resource management policies - Provide guidance to obtain necessary environmental

	permits during the implementation of the TA - Support development of the manual for management of the infiltration gallery system and monitoring of groundwater quality
Ministry of Fisheries, Marine Resources and Agriculture	- Support facilitation of the TA implementation in consultation with farmers and farming communities in HDh.Nolhivaranfaru Island - Support activities of the TA related to capacity building of farmers and farming communities - Support sharing knowledge and information generated from the TA with farmers and farming communities in other islands
Island Council	- Provide administrative support to implement the TA in HDh.Nolhivaranfaru Island - Support facilitation of the O&M of the infiltration gallery system and groundwater monitoring wells - Ensure the TA implementation and the selected site for the TA are in line with land-use plans of the island - Support facilitation of stakeholder engagement
Atoll Council	- Provide administrative support for Island Council to obtain necessary permits during the implementation of the TA - Guide Island Council regarding all administrative matters related to the implementation of the TA
Farming community	- Support facilitation of the TA implementation - Adopt knowledge and information generated from the TA and share them with farmers and farming communities in other islands
Community Based Organisations (CBOs)	- Promote and participate in activities of the TA - Support dissemination and replication of the infiltration gallery system in other farming communities and islands

12. SDG Contributions:

*Instructions: Please complete the shaded 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	This TA will make farming communities access groundwater for agriculture easier and more efficient than before, which will contribute to increasing crop production and achieving food security in HDh.Nolhivaranfaru Island.
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 ensure sustainable use of limited water resources (groundwater) with minimum impact on the aquifers in HDh.Nolhivaranfaru Island.
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	
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	This TA will contribute to enhancing climate resilience in HDh.Nolhivaranfaru Island by providing the sustainable, efficient method for groundwater extraction for agriculture to farming communities in the island.
	13.2 - Integrate climate change measures into national policies, strategies and planning	
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	This TA will provide the recommendations to increase water use efficiency for agriculture, the guide materials for sustainable agriculture practices and the manual for management of the infiltration gallery system and monitoring of groundwater quality as well as organise the training of trainer programme, which will contribute to capacity building and awareness-raising of farming communities in HDh.Nolhivaranfaru Island and agriculture-related stakeholders in Maldives.
	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.