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## TERMS OF REFERENCE (TOR)

**Title: Technical assistance for saline water purification technology at household level and low-cost durable housing technology for coastal areas of Bangladesh**

CTCN request reference number: 2016000071

### **1 BACKGROUND INFORMATION**

The Climate Technology Centre and Network (CTCN) is the operational arm of the United Nations Framework Convention on Climate Change (UNFCCC) Technology Mechanism and hosted by the United Nations Environment Programme (UNEP) in collaboration with the United Nations Industrial Development Organization (UNIDO) and supported by 11 partner institutions with expertise in climate technologies. The mission of the CTCN is to promote accelerated deployment and transfer of climate technologies at the request of developing countries for energy-efficient, low-carbon and climate-resilient development.

These requests for Technical Assistance are being submitted to the CTCN by the National Designated Entity of the respective country. The scope of services under these Terms of Reference shall be executed based on a restricted solicitation process where only accepted Members of the CTC Network, are eligible to submit proposals. Should the bidder partner with another institution to deliver a minor part of the services described in these Terms of Reference, it is expected that the partner institution also joins the CTC Network.

In case you are not a CTCN network member yet, you may bid for implementation of the technical assistance, subject to the condition that you submit your completed application for CTCN Network membership before the last date of the bid closure and the same is acknowledged by the CTCN. Furthermore, the contract award – should your bid be selected – is conditional to your network membership application having been successfully approved by the Director of CTCN.

The maximum estimated budget for this contract is 200,000USD and is subject to a competitive bidding.

### **2 CONTEXT OF THE ASSIGNMENT**

Bangladesh is a low-lying coastal country with a population of approximately 160 million. Nearly 30% of Bangladesh's inhabitants live in coastal zones, and as a result, are highly vulnerable to climate impacts. Around Bangladesh, these impacts typically take the form of extreme weather events and flooding, and are expected to increase in frequency and intensity in coming years due to climate variability.

In the country's coastal areas, climate resilience is of growing concern. Challenges that in particular the poor population is facing are due to inadequate housing to cope with climate change disaster as well as



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salination from rising sea levels. In particular, houses in coastal zones are often not built for climate resilience due to lack of knowledge or funding.

Due to sea-level rise, saline water intrusion in the coastal areas increased significantly, while fresh water flow from upper riparian tributaries is gradually decreasing. As a consequence land is becoming saturated with saline water and potable water is becoming scarcer. In saline areas this has led to an increased burden on people, in particular women and children of poor households to collect freshwater. Salinity in water is also cause for major health hazards including high blood pressure. Communities are equipped with community desalination plants, however they may not be working properly due to either technical difficulties or lack of knowledge on the operational part. In addition these plants are expensive and hence up-scaling and installing these plants on a large scale is not an option.

Low-cost climate resilient housing is another important issue. Due to the high level of poverty many houses are made of low quality local wood, and bricks made from a mixture of local sand and saline water, unable to withstand disaster such as cyclones or storm surges. During the wet season the materials are prone to soak humidity up and de-moisturize during the dry season making the structures fragile. Introducing low-cost salinity proof structures for poor coastal communities would have a huge impact on building their climate resilience.

The Palli Karma-Sahayak Foundation (PKSF) is a not for profit organization established by the Government of Bangladesh in 1990, for sustainable poverty reduction through employment generation. Part of PKSF's mandate is to enhance the capacities of the poor to increase their resilience to the adverse impacts of climate change. PKSF has been rolling out several related initiatives under its Community Climate Change Project (CCCP) in the coastal zone of Bangladesh (Districts: Khulna, Satkhira, Bagerhat, Chittagong, Cox's bazar) to address climate change related challenges. However lack of technical knowledge hinders the identification and introduction of affordable climate resilient housing and desalinization technologies. Therefore, the government of Bangladesh has requested technical assistance from the CTCN.

### **3 OBJECTIVE OF THE CONTRACT**

The objective of the CTCN Technical Assistance is to support the climate vulnerable coastal areas of Bangladesh and the Palli Karma-Sahayak Foundation (PKSF) with the identification and introduction of household level desalination technique(s) as well as low-cost salinity proofed housing option(s) in coastal areas of Bangladesh. Furthermore, it is expected that the results and outcomes of the Technical Assistance induce a GCF project to replicate or scale-up pilot(s) nationally.

#### **Scope and Expected Outputs of the Proposed Contracted Services**

The Contractor is expected to produce the following outputs, with the understanding that the final set of activities and deliverables will be defined in the response plan:



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### Output 1: CTCN Response Plan designed

As per CTCN procedures, any CTCN technical assistance should be implemented based on a 'response plan' that defines the activities and results expected of the assistance and that is approved by the country national Designated Entity, the requesting organization and the CTCN Director.

Therefore, the first step for the contractor in the implementation will be to lead the development and design of this response plan, in collaboration with all required stakeholders. The template of the CTCN response plan is attached to this ToR. The CTCN Response Plan will include an assessment of the context, problem statement, detailed logical framework of activities and linkages to the national mitigation and/or sector priorities. It should also contain a detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organizations to implement the Response Plan, as well as 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.

As per the CTCN procedures, the Contractor will:

- Undertake a detailed desk study of relevant existing studies, reports and other documents related to best practices as well as relevant institutions involved for low-cost housing and small-scale desalination techniques, particularly applicable to coastal zone.
- Conduct an inception mission in Bangladesh, to meet with key stakeholders and set the based of the response plan to be designed.
- Formulate a proposed CTCN technical assistance intervention in the form of a so-called Response Plan based on the desk study and in direct collaboration with the NDE, the Department of Environment (DoE), Bangladesh, PKSF and other stakeholders (through bilateral meetings, inception workshop or other ways, as appropriate).

The CTCN Response Plan development will derive from the activity 2 to 6 outlined in this Terms of Reference, but will be more detailed, and informed by consultations with key stakeholders in Bangladesh and the NDE notably, as well as done in close coordination with the CTCN Technology Manager. To be able to move forward on the assistance, the Response Plan will first need to be agreed and signed by the NDE the requesting organization and the CTCN, as per CTCN processes. The contractor will use the CTCN Response Plan template and guidance note in Annex 1.

Deliverable for Activity 1
<ul style="list-style-type: none"><li>- CTCN Response Plan for the technical assistance signed by NDE, proponent, and CTCN Director</li><li>- Two page CTCN Impact Description formulated pre-implementation and updated post implementation (as per template in Annexes)</li></ul>



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### Output 2: District stakeholders engaged in the process

Based on the signed Response Plan, with the guidance of the National Designated Entity and PKSF, the Contractor will start engaging the communities of the concerned districts.

Consultations will enable to understand the technologies and practices already used by the communities, their challenges, successes and the technology gaps that remains to be filled. This will also enable the contractor to identify 'champions' or leaders in communities, to work closely with them in identifying technologies, and to train once the technologies will be prioritized.

In order to achieve this output, the following activities could be considered (but not limited to those):

- Conduct a national level inception workshop with the objective to ensure a mutual understanding of proposed activities, method for implementation and expected outputs from the CTCN Technical Assistance.
- Conduct district level kick-off meetings, in the districts selected for the technical assistance.

Participants should include key stakeholders from national and local government as well as non-government sector.

Deliverables for Activity 2
<ul style="list-style-type: none"><li>- Reports on the stakeholder consultations and engagement</li><li>- Project inception report summarizing implementation arrangements, activities and key milestones</li></ul>



### Output 3: The most promising and low-cost domestic climate resilient housing technology solutions for the local conditions are identified and prioritized

In order to achieve this output, the following activities could be considered (but not limited to those):

- Review of existing low-cost domestic climate resilient housing technology solutions used in other countries and analyze their suitability and applicability in the context of coastal regions of Bangladesh. A set of 10 to 20 relevant technology solutions will be identified,, which have potential relevance for the geo-physical, social, economic and cultural context of coastal Bangladesh.
- Visit the selected districts and intervention areas to understand the local settings of coastal Bangladesh. The construction materials need to be locally available.
- For each technology option, describe the design considerations, technical feasibility, potential impact, cost, materials, and images, and other information useful for national and local specialists to fully understand and prioritize among these options. This material will be conveyed as menu in the form of a written report and Power Point slides that are easily acceptable to both national and local actors, in English and Bengali.



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- Prioritize a number of climate resilient low cost climate technology solutions based on strategic prioritization criteria with guidance from the National Designated Entity and PKSf.
- For each of the prioritized solutions, provide greater depth of information, including detailed step by step instructions in English and Bengali and images for installing them, which can be drawn from to adapt into learning materials for used by local actors and PKSf in trainings of household level local community members.

### Deliverable for Activity 3

- Fact finding report on low cost housing technology solutions implemented nationally and in other countries including a list of relevant stakeholders involved, including information on local requirements and context for low cost housing technology solutions and a set of prioritization criteria for low cost housing technology solutions
- Reports from consultations with stakeholders
- Recommendation for conceptual and operational design information along with features and minimum specifications for low-cost housing technology solutions applicable for coastal Bangladesh

### Output 4: The most promising and low-cost technologies for purification of saline water at household level are identified and prioritized

In order to achieve this output, the following activities could be considered (but not limited to those):

- Identify a set of relevant technology solutions for purification of saline water at household level, drawing from emerging and known approaches in other countries, which have potential relevance for the geo-physical, social, economical and cultural context of coastal Bangladesh.
- For each technology option, describe design considerations, technical feasibility, potential impact, cost, materials, and images, and other information useful for national and local specialists to fully understand and prioritize among these options. This material will be conveyed as menu in the form of a written report and Power Point slides that are easily acceptable to both national and local actors, in English and Bengali.
- Prioritize a number of water purification technology solutions based on a strategic prioritization criteria and guidance from the National Designated Entity and PKSf.
- For each of these prioritized solutions, provide greater depth of information, including detailed cost estimation and detailed step by step instructions in English and Bengali and images for applying them in the field, which can be drawn from to adapt into learning materials for used by local actors and PKSf in trainings of household level local community members.

### Deliverable for Activity 4

- Fact finding report on technologies for purification of saline water at household level implemented nationally and in other countries including a list of relevant stakeholders involved, including information on the local requirements and context for purification of saline water at household level, and prioritization criteria for technologies for purification of saline water at household level



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| <ul style="list-style-type: none"><li>- Reports from consultations with stakeholders</li><li>- Conceptual and operational design information along with features and minimum specifications for technologies for purification of saline water at household level applicable for coastal Bangladesh</li></ul> |
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### **Output 5- Building capacities of communities on proposed technology solutions through training, testing and piloting**

Based on identified technology solutions, and in order to achieve this output, the following activities could be considered (but not limited to those):

- Design and provide training in cooperation with PKSF and DoE for relevant stakeholders.
- Identify appropriate sites for piloting of the proposed solutions, in cooperation with PKSF and DoE. Additional funding for pilot activities may be available through PKSF and/or DoE.

Deliverable for Activity 5
<ul style="list-style-type: none"><li>- Set of training materials used during the training</li><li>- Training report describing the topics covered, participants, outputs, challenges and successes</li><li>- List of sites for piloting of the proposed solutions</li></ul>



### **Output 6 – Support to identifying financing opportunities to upscale deployment of technologies identified**

CTCN assistance will support the country in identifying source of financing for deploying the technologies prioritized in the long-term and at a large scale.

In order to achieve this output, the following activities could be considered (but not limited to those):

- Develop a strategy for engaging private sectors actors to enable sustainable funding for these technologies
- Approach and create connection with possible interested private sectors actors for the deployment of these technologies
- Strengthen design of a large scale project concept in order to seek financing for deployment of the identified technology solutions. The contractor will:
- Refine the findings and products produced through activities 1 through 4 of the CTCN assistance to be directly relevant as supportive material for a large scale project concept,
- Present this material in at least one meeting to the relevant authorities and partners, subject to approval of the National Designated Authority/National Climate Change Focal Point.

The output from this activity will be an overview of the products and learning gained through this technical assistance in a format that will be useful to support the project concept requirements for Green



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Climate Fund, or other bilateral or multilateral financing opportunities. The concepts should be, one for general in nature and another one for access funding from GCF Window.

<b>Deliverable for Activity 5</b>
- General project concept document
- Concept note in a GCF format

**Output 7 – Final report**

A final Report, which summaries all the activities conducted, challenges and lessons learned, and an updating of the brief description of intended impact due to this assistance produced in activity 1. The template will be provided by the CTCN.

<b>Deliverable for Activity 6</b>
- Final closure report (as per CTCN template)

**4 GENERAL TIME SCHEDULE AND ACTIVITY/DELIVERY PLAN**

The activities under this contract should be completed within a period of 8 months to 1 year from signing the contract.

Indicative plan for implementation of activities and deliveries:

Activities and Deliverables	Month							
	1	2	3	4	5	6	7	8
Deliverable 1:								
Deliverable 2:								
Deliverable 3:								
Deliverable 4:								
Deliverable 5:								
Deliverable 6:								
Deliverable 7:								

All draft and final deliverables will need to be cleared by NDE & PKSF and approved by the CTCN Climate Technology Manager before these can be finalized.

**5 PERSONNEL IN THE FIELD (PROFESSIONAL EXPERIENCE AND QUALIFICATIONS)**

The Contractor is expected to provide the services of a team that should ideally comprise the following competencies:

- Proven experiences on technical assessments, piloting and deployment of technology options for low-cost climate resilient housing



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- Proven experiences on technical assessments, piloting and deployment of desalination technique on the household level.
- Experiences with conducting training on community-level
- Experiences in providing strategic and operational recommendation to government and non-government sector
- Experience in engaging the private sector for technology deployment in a sustainable way
- Experience in securing financing from various private and public sources for similar types of efforts

Working experiences from Bangladesh or other coastal vulnerable regions are preferred for all of the above items. Furthermore, having national Bangladeshi experts as part of the implementation team is required. The CVs of the respective experts assigned to this assignment by the Contractor must be provided.

### **6 LANGUAGE REQUIREMENTS**

The working language for the purposes of this assessment is English, thus an excellent command of English is required of the proposed personnel. However, Bengali command is required to make the Bengali version of all the submitted documents.

All delivered documents must be of sufficient enough quality so that no further editing shall be required.