CTCN Technical Assistance
Request Submission Form

Please fill in the form in the grey spaces, by following the instructions in italic.

Requesting country:	*Bangladesh*

Request title:	*Technical Assistance for Enhancing longer lead-time flood forecasting and strengthened community dissemination in Bangladesh*

Contact information:

{Please fill in the table below with the requested information. The request proponent is the organization that the request originates from, if different from the National Designated Entity (NDE).}

	National Designated Entity	**Request Applicant**
Contact person:	**Md. Moniruzzaman**	*Md Saiful Hossain*
Position:	Director General (Aditional Charge)	*Superintending Engineer*
Organization:	*Department of Environment, Government of Bangladesh.*	*Processing Flood Forecasting Circle, Bangladesh Water Development Board*
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Technology Needs Assessment (TNA):

{Select one of the three boxes below:}

☒ *The requesting country has conducted a TNA in October 2012*

☐ *The requesting country is currently conducting a TNA*

☐ *The requesting country has never conducted a TNA*

{If the requesting country has completed a TNA, please indicate what climate technology priority this request directly relates to. Please indicate reference in TNA/TAP/Project Ideas.}

CTCN Request Incubator Programme:

{Please indicate if this request was developed with support from the Request Incubator Programme:}

☒ *Yes*

☐ *No*

Geographical focus:

{Select below the most relevant geographical level for this request:}

☐ *Community-based*
☒ *Sub-national*
☐ *National*
☐ *Multi-country*

{If the request is related to the sub-national or multi-country level, please indicate here the areas concerned (provinces, states, countries, regions, etc.)}

Monsoon flood affected areas of Ganges, Brahmaputra and Meghna river basins within Bangladesh

Theme:

{Select below the most relevant theme(s) for this request:}

☒ *Adaptation to climate change*
☐ *Mitigation to climate change*
☐ *Combination of adaptation and mitigation to climate change*

Sectors:

{Please indicate here the main sectors related to the request. e.g. energy, industry, transport, waste, agriculture/fisheries, forestry, water, ecosystem/biodiversity, coastal zones, health, education, infrastructure/human settlement, tourism, businesses, early warning/disaster reduction, institutional design and mandates, cross-sectorial}

Early Warning/disaster risk reduction

1. *Technical improvement of the 'Climate Forecast Application for Bangladesh' model for generating more accurate discharge forecast for 10 days probabilistic flood forecast*
2. *Technical assistance for operationalizing seasonal flow outlook for Ganges, Brahmaputra and Meghna rivers for flood flow and hydrological drought monitoring*
3. *Strengthen community dissemination of flood forecast and early warning through capacity building and innovative mobile services*

Problem statement *(up to one page):*

{Please describe here the difficulties and specific gaps of the country in relation to climate change, for which the country is seeking support from the CTCN. Please only provide information directly relevant to this request, and that justifies the need for CTCN technical assistance.}

Bangladesh is the fifth most disaster prone country all over the world having the highest risk of flood hazard in south Asia. Approximately 20-30% of the country is flooded each year which can reach 70% during catastrophic floods. This causes loss of life, disruption to livelihoods and significant damage to crops, livestock and infrastructure. Over the last decades, with climate change, growing population and human activity on floodplains, floods have become more frequent and acute. In a changing climate, the behavior of flooding is likely to change and more frequent extreme events are expected with varying intensity. These may adversely affect the life and livelihood of flood vulnerable communities of Bangladesh. Lying in the outlet of the Ganges-Brahmaputra-Meghna river basin and having a flat

topography, Bangladesh is hardly able to control the floods with structural measures. There has been a shift in the paradigm since early 2000's towards flood management in combination with structural and non-structural measure with an emphasis for non-structural measures like flood forecasting and early warning.

The Flood Forecasting and Warning Center (FFWC) under the Processing Flood Forecasting Circle (PFFC) of the Bangladesh Water Development Board (BWDB) is the mandated organization for generating flood forecast and issuing flood early warning. FFWC produces 3 days deterministic flood forecast which has been experimentally extended up to 5 days but not sufficient enough for planning, preparedness and flood management. Again, there is high demand in the community for medium and longer range flood forecasting especially for farmers and agricultural extension workers because even 10 days lead time is sometimes not enough for long term planning.

Moreover, the available flood forecast products of FFWC are underutilized owing to the weak dissemination linkages to the remote flood vulnerable communities. The forecast and warning messages are mainly disseminated to national level stakeholders and district level offices. However, there are lack of capacity and resources in dissemination from district down to the village and household level. Again, even though the forecast reaches the community level, there are lack of capacity in interpreting and applying the forecast.

Past and ongoing efforts *(up to half a page):*

{Please describe here past and on-going processes, projects and initiatives implemented in the country to tackle the difficulties and gaps explained above. Explain why CTCN technical assistance is needed to complement these efforts, and how the assistance can link or build on this previous work.}

Past and Ongoing Efforts

1. ***10 days probabilistic forecast:*** *FFWC generates 1-10 days probabilistic forecast for 38 locations of Bangladesh with technical support from Regional Integrated Multi-Hazard Early Warning System (RIMES).It took more than a decade for FFWC to operationalize this forecasting tool. The 'Climate Forecast Application for Bangladesh (CFAB)' model which is the background model for the 10 days forecast was developed in collaboration with RIMES and National Center for Atmospheric Research, Georgia Tech in the 2000's. Over time, the technology has further changed and the model needs technical improvements for better and more accurate forecasting on a longer range.*

2. ***Hydrological Outlook:*** *FFWC has previously conducted research, in collaboration with RIMES on generating 1-3 months flow outlook for Brahmaputra and Ganges rivers which showed promising results. This experimental hydrological modelling system uses the ensemble mean of the European Center for Medium range Weather Forecast (ECMWF's) 6 month precipitation forecast which is made available to FFWC through RIMES.. With further technical assistance this system can be operationalized and applied for flood flow and hydrological drought monitoring across the major rivers of Bangladesh. Such, seasonal outlooks can be applied to promote climate-smart agriculture and improve adaptation capacity.*

3. ***Community Dissemination:*** *FFWC has developed its website (ffwc.gov.bd) under the Comprehensive Disaster Management Program II during 2013-2014 for improving the dissemination mechanism. Again, the under the same project the nation Interactive Voice Response system was developed where people can access the national level forecast by calling a number (10941). However, the system is yet to be toll free and does not provide the localized*

information. In order to further improving the dissemination, FFWC has piloted voice message broadcasting in 3 districts of Brahmaputra basin which provided localized flood forecast and or warning directly to the vulnerable communities and disaster management committees.

Assistance requested *(up to one page):*

{Please describe here the scope and nature of the technical assistance requested from the CTCN and how this could help address the problem stated above and add value vis-à-vis the past and on-going efforts. Please note that the CTCN facilitates technical assistance and is not a project financing mechanism.}

CTCN's technical assistance is required for the followings:

1. *Enhancing FFWC's Capacity in generating more accurate medium range flood forecast: The existing CFAB modelling technique would have to be improved considering the latest development in data acquisition and forecasting, a state-of-the-art modelling scheme would be established which. In addition to ECMWF's precipitation forecast, currently the lump-distributed modelling system is using different satellite based data which would to be upgraded and amount of error should be reduced. The modelling technology would be transferred to FFWC through intense training and the tools would be integrated into their existing operational system.*

2. *Generating Seasonal Hydrological Outlook: In order to operationalize the seasonal hydrological outlook, the existing scheme should be expanded to Meghna River, the value for normal flow/hydrological drought should be set and verified. In situ discharge measurements should be arranged if required for the model calibration or validation. Furthermore, the feasibility of using different ensemble members in seasonal flow outlook generation needs to be assessed. Arrangement should be made for multidisciplinary discussion and dissemination of seasonal hydrological outlook with a view to identifying the use and encourage the use of the products.*

3. *Strengthening linkages of community dissemination: For improving the poor community linkages of flood forecasting and early warning dissemination, an integrated dissemination system should be developed taking the advantage of latest developments in ICT. The system should provide a scope to scale up voice message broadcasting in the flood vulnerable areas, incorporate push and pull sms service and auto generated email services etc. Capacity building trainings for the disaster management stakeholders including local government institutions and disaster management committees would be arranged to improve the forecast and warning interpretation skills,*

Expected benefits *(up to half a page):*

{Please outline here the medium and long-term impacts that will result from the CTCN technical assistance, including how the assistance will contribute to mitigate and/or adapt to climate change.}

Medium Term Impacts

1. *Strengthening FFWC's capacity in application of climate forecast and enable them to generate more accurate medium range 1-10 days probabilistic flood forecast and longer range hydrological outlooks. These products are essential to cope with the extreme hydrological events that are likely to get worsen with the changes in climate.*
2. *CTCN's technical assistance in strengthening the linkages of the end-to-end early warning system will increase the dissemination coverage, improve the dissemination mechanisms and*

create better ways of communication with the vulnerable communities battling with climate change.

Long Term Impacts

1. *The climate and flood forecast products developed with the CTCN's technical assistance will in the long run contribute in disaster risk reduction and climate risk management. For example, application of longer range flood forecast and hydrological outlooks would enhance the foreseeability of the community, capacity of assessing the risk; adapt and prepare based on these knowledge.*
2. *With new technologies FFWC as an institution would grow as center of excellence and with the enhanced capacity of the local disaster management capacities, the gaps in interpretation, use and application of forecast would be minimized.*

Post-technical assistance plans *(up to half a page):*

{Please describe here how the results of the CTCN technical assistance will be concretely used by the applicant and national stakeholders, to pursue their efforts of resolving the problems stated above after the completion of the CTCN intervention (list specific follow-up actions that will be undertaken).}

Within the technical assistance period, FFWC will adopt the newly developed forecast products in their operational system and disseminate the forecast through their existing and newly added dissemination mechanisms. RIMES will provide in situ and remote technical assistance for further troubleshooting for the technologies transferred as part of their commitment of service delivery to its member states. Following follow up actions would be undertaken:

1. *The performance of the technologies transferred would be evaluated and published in the annual reports of FFWC*
2. *The use, applications and performance evaluation of the products would be discussed and followed up with the relevant stakeholders through the annual monsoon forums, a platform where the national hydro-meteorological forecasting agencies and stakeholders meet which is hosted by the Bangladesh Meteorological Department*
3. *Post flood/drought assessments would be arranged at the community level to inspect the capacity of the disaster management committees and usability of the forecast products*

Key stakeholders:

{Please list in the table below the main stakeholders who will be involved in the implementation of the requested CTCN technical assistance, and what their role will be in supporting the assistance (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.). Please indicate what organization(s) will be the main/lead counterpart(s) of CTCN experts at national level, in addition to the NDE.}

Stakeholder	Role to support the implementation of the assistance
National Designated Entity (NDE)	*Will submit the proposal to CTCN after having it reviewed by its technical committee.*

Department of Environment (DoE)	*Will provide technical support to NDE*
Processing & Flood Forecasting Circle (PFFC), BWDB	*Will initiate the proposal and send it to NDE. Act as the main counterpart of CTCN in addition to NDE.*
Regional Integrated Multi-hazard Early Warning System (RIMES)	*Will provide technical support to PFFC, FFWC and NDE for implementation. Act as the lead technical counterpart of CTCN.*
Local Government Institutions (LGIs)	*Will provide relevant support to implement the activities at the field level.*
Disaster Management Committees	*Will provide relevant support to implement the activities at the field level.*
Civil Society Action Group (NGO representatives and local elites)	*Will provide relevant support to implement the activities at the field level and help to identify the beneficiaries and to ensure transparency, accountability and monitoring.*

Alignment with national priorities *(up to half a page):*

{Please demonstrate here that the technical assistance requested is consistent with documented national priorities (examples of relevant national priorities include: national development plans, poverty reduction plans, technology needs assessments (TNAs), LEDS, NAMAs, TAPs, NAPs, sectorial strategies and plans, etc.). For each document mentioned, please indicate where the priorities specifically relevant to this request can be found (chapter, page number, etc.).}

Name of document	***Year***
Bangladesh Climate Change Strategy and Action Plan	*2009(Programme –T2P1, Page-42)*
Bangladesh Technology Needs Assessment and Technology Action Plans for Climate Change Adaptation (Part-2)	*2012(Chapter-1, Article # 1.2.2, Page- 12, Article # 1.3.2, Page- 16, Article # 1.4.1.2, Page-25)*

Development of the request *(up to half a page):*

{Please explain here how the request was developed at the national level and the process used by the NDE to approve the request before submitting it (who initiated the process, who were the stakeholders involved and what were their roles, and describe any consultations or other meetings that took place to develop and select this request, etc.)}

Expected timeframe:

{Please propose here a duration period for the assistance requested.}

Total 24 months

Activities	**Months**				
	1-3	3-6	6-12	12-18	18--24
1. Assessment of existing models and identify the activities					

2. Methodology development and selection of user					
3. Technology transfer, training and implementation					
4. Impact assessment, user engagement and evaluation					

Background documents:

{Please list here relevant documents that will help the CTCN understand the context of the request and national priorities. For each document, provide weblinks if available, to attach to the submission form while submitting the request. Please note that all documents listed/provided should be mentioned in this request in the relevant question(s), and that their linkages with the request should be clearly indicated.}

BWDB arranged a national level workshop with its key stakeholders including government agencies, non-government organizations, researchers and academicians on 14 September 2014 titled as 'Enhancing Early Warning System for Community Based Response in Bangladesh' which focused on the development of 10 days probabilistic forecasting, flash flood forecasting and seasonal flow outlook generation and their application in community based response to flooding. Some of the proposed developments in longer range flood forecasting are from the key recommendation of the workshop. Following the workshop, BWDB has further developed the ideas through the 7th and 8th council meeting of RIMES held during July 2015 and July 2016 in India and Thailand respectively. The proposal for technical assistance has also taken into account the recommendations cropped up from the 'Regional Workshop on Flood Forecasting and Early Warning' held in Thailand during 22-27th November 2015, facilitated by NCAR, Asian Institute of Technology and RIMES. Finally, these accumulated ideas were discussed by the PFFC with the Department of Environment (DoE) and as the NDE, they have decided to propose this as potential ideas for CTCN's technical assistance.

Monitoring and impact of the assistance:

{Read carefully and tick the boxes below.}

☒ By signing this request, I affirm that processes are in place in the country to monitor and evaluate the assistance provided by the CTCN. I understand that these processes will be explicitly identified in the Response Plan in collaboration with the CTC, and that they will be used in the country to monitor the implementation of the CTCN assistance.

☒ I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

Signature:

NDE name:	**Md. Moniruzzaman**
Date:	30 April 2021
Signature:	

THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG
Need help? The CTCN team is available to answer questions and guide you through the process of submitting a request. The CTCN team welcomes suggestions to improve this form.

>>> Contact the CTCN team at ctcn@unep.org