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UN environment programme | CTCN CLIMATE TECHNOLOGY CENTRE & NETWORK

Adaptation Fund Climate Innovation Accelerator

Project Concept Note - Technical Assistance Response Plan

Country	**Viet Nam**
Request ID#	**AF-2021000099**
Title	Localization of water resources management technology to adapt to climate change in Hong-Thai Binh river basin
NDE	Mr. Pham Van Tan Deputy Director General, Department of Climate Change Ministry of Natural Resources and Environment pvtan11@gmail.com No. 10 Ton That Thuyet street, Nam Tu Liem district, Hanoi, Viet Nam
Proponent	Mr. Nguyen Chi Nghia Director General, North Division for Water Resources Planning and Investigation National Center for Water Resources Planning and Investigation nguyenchinghia@gmail.com No. 10, Lane 42 Tran Cung, Nghia Tan, Cau Giay district, Hanoi, Viet Nam

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)

The objective of the technical assistance (TA) is to select and customize technologies that can provide science-based information on transboundary water resources (e.g., river water flow) in the Hong-Thai Binh river basin in Viet Nam. In this TA, previous and ongoing climate change risk and challenges to transboundary water resource management in the river basin will be identified, and the most appropriate technologies providing data on transboundary water resources in the river basin will be selected, based on consultations with the NDE of Viet Nam and the proponent. The selected technologies will be then customized to provide the selected data in the river basin. Afterwards, a technical manual and capacity building program will be developed, and the training of government officials and relevant stakeholders will be conducted to enhance their capacity on the use of the selected technologies in the river basin. It is expected that more accurate, integrated planning for transboundary water resource management in the Hong-Thai Binh river basin will be ensured by using the science-based information provided by the technologies to be selected and customized through the TA, thus ensuring greater effectiveness of water resource management and Viet Nam's capacity to address water-related climate change risks.

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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: Pham Van Tan
Title: Deputy Director General, Department of Climate Change
Date:
Signature:

Proponent (signature of the Proponent is optional)
Name: Nguyen Chi Nghia
Title: Director General, North Division for Water Resources Planning and Investigation
Date:
Signature:

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Rose Mwebaza
Title: CTCN Director
Date: 13/08/2021
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)

The Hong-Thai Binh river basin is a transboundary river basin, with a total area of 169,000 km^2 encompassing three countries (China, Laos and Viet Nam), of which 88,860 km^2 are located in the territory of Viet Nam. It has 5 major tributaries (Da River, Red River, Chay River, Lo River, and Gam River) which originate in China and flow into Viet Nam. From the administrative perspective, the Hong-Thai Binh river basin covers 25 provinces with a population of 29 million people (estimate for 2015)[1], showing the largest population density in Viet Nam.

The climate in Hong-Thai Binh river basin is homogeneous and has subtropical characteristics[2], with 85% to 90% of the total annual precipitation falling during the rainy season from May to October. The use of water resources upstream, located in the territory of China, has significantly affected the water regime of the Hong-Thai Binh river basin in the territory of Viet Nam. Moreover, the impact of climate change (e.g., drought, extreme/flash flood, etc.) has also brought about challenges to communities and households living in the river basin.

According to the Government's river basin development strategy in Viet Nam, the first priority is to finalize water resource management plans for the major river basins in the country, including the Hong-Thai Binh river basin. Accessing reliable, up-to-date information on transboundary water resources is very important and plays a decisive role in developing water resource management plans at the river basin level. In particular, for water resource management planning in the Hong-Thai Binh river basin, it is necessary to identify the amount of water flow from China into Viet Nam (e.g., average annual flow, monthly flow and 10 days flow) and its variation due to different water uses in China (including irrigation and human consumption), as well as due to climate change. Such data is required to enable more effective water resources management planning, and thus to protect water resources for long-term use and to prevent negative impacts associated with ineffective water resources management.

As no formal data sharing agreement among the countries in the Hong-Thai Binh river basin has been made[3], access to data and information on transboundary water resources such as the amount of water flowing into Viet Nam from China is very limited, affecting not only water usage but also water resource management planning in the Hong-Thai Binh river basin in Viet Nam.

[1] Minister of Natural resources and Environment (2020) Task of integrated water resources planning for the Red – Thai Binh River basin in the period of 2021 – 2030, vision to 2050.

[2] https://www.redriverprogram.com/en/introduction-of-the-red-river-basin/

[3] Ho, C., Nguyen, A., Ercan, A., Kavvas, M. L., Nguyen, V. and Nguyen, T. (2020) Assessment of atmospheric conditions over the Hong Thai Binh river watershed by means of dynamically downscaled ERA-20C reanalysis data. Journal of Water and Climate Change, 11(2), 540-555.

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)

To acquire data on amount of water flow from China into Viet Nam in the Hong-Thai Binh river basin, Viet Nam has applied a hydrological model to convert rainfall data into runoff data. The rainfall data has been extracted from:

- data collected from meteorological stations near the border of Viet Nam
- rainfall data received from satellite open sources (e.g., CHIRPS[4] and TRMM[5])

When using the rainfall data observed in Viet Nam, the simulations of water flow into Viet Nam have large errors. Rainfall data from satellite open sources are applied by some universities and research institutes for short-term or medium-term forecasting (day, month or 6 months), but are not deemed relevant to be used for water resource management planning by the national and sub-national water authorities in Viet Nam.

Due to limitations in data availability, the simulations of water flow from China into Viet Nam in the Hong-Thai Binh river basin have errors greater than 50%, compared with in-situ data. Viet Nam is currently using a statistical method, applying in-situ data from monitoring stations located at the border areas between two countries; however, this is a temporary solution, because the reliability of this method is still low.

[4] Climate Hazards Group InfraRed Precipitation with Station data
[5] The Tropical Rainfall Measuring Mission

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.)

	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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.* Support to select and customize technologies that can provide science-based information on transboundary water resources in the Hong-Thai Binh river basin in Viet Nam																		
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)* Accurate, integrated planning for transboundary water resource management in the Hong-Thai Binh river basin will be ensured by using science-based information provided through the selected technologies.																		
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 (Project Concept Note) developed. The detailed work plan and budget must be based directly on this Response Plan (Project Concept Note); 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 (Project Concept Note)); iii) Impact statement formulated at the beginning of the TA and updated/revised once the TA is fully delivered (a template will be provided); and iv) A technical assistance closure report completed at the end of the TA (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: Identification of climate change risk and challenges to transboundary water resource management in the Hong-Thai Binh river basin																			
Activity 2.1: A kick-off meeting, stakeholder consultations and site visit A kick-off meeting and consultations with government and non-government stakeholders will be carried out (in-person or online[6]). Through this activity, the lead implementer will understand the expectations of stakeholders about the TA. Moreover, information on the current process of the generation and provision of information/data on transboundary water resources (e.g., rainfall, river water flow and river water level) in the Hong-Thai Binh river basin (sub-national level) and in Viet Nam (national level), as well as water governance issues (including transboundary issues) will be shared with the lead implementer during stakeholder consultations.																			

[6] 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 proponent and the national expert.

The lead implementer with support from the proponent (National Center for Water Resources Planning and Investigation, NAWAPI) will visit the Hong-Thai Binh river basin, including the border areas between Viet Nam and China and check the current access and quality control of water data in the field[7].																			
Activity 2.2: Review of challenges and climate change risk to transboundary water resource management in the Hong-Thai Binh river basin The lead implementer will carry out literature review and interviews with central/local government officials and relevant stakeholders (if required) to identify (1) challenges to transboundary water resource management in the Hong-Thai Binh river basin (including data collection and sharing of transboundary water resources) (2) previous and ongoing climate change impacts on water resources (e.g., rivers and their tributaries) in the river basin, (3) technologies/measures applied to assess and address climate change risk to water resources in the river basin and (4) multilateral/national/local efforts to manage and/or reduce climate change risk in the river basin.																			
Activity 2.3: Investigation of case studies on the use of different models of data management and sharing for transboundary water resource management at the river basin level The lead implementer will review different examples and best practices for data management and sharing arrangements related to transboundary water resource management at the river basin level. Through this activity, results and lessons learned from completed and ongoing projects/programmes conducted in Viet Nam and other countries to collect/generate and provide data on transboundary water resources will be identified. The following matters (but not limited to them) would be considered:																			

[7] The border lockdown due to the COVID-19 pandemic is still in effect at the time of the formulation of this Response Plan (Project Concept Note). If restrictions continue through implementation the national expert with support from the proponent will conduct the site visit on behalf of the lead implementer, with the strong guidance and remote support from the latter.

• Identification of challenges (e.g., political dialogue requirement, data gaps, stakeholder capacity, etc.) in each case • Identification of transboundary water resource data collected and monitored in each case • Analysis of the water resource management models used, and measures put in place (including M&E systems, legal frameworks and policy instruments), and respective lessons learned that could be relevant to the Hong-Thai Binh river basin in Viet Nam.																			
Activity 2.4: Assessment of data needs Based on findings from Activities 2.1 - 2.3, the lead implementer in consultation with the proponent and the NDE of Viet Nam will complete a data needs assessment for transboundary water resource management and planning in the Hong-Thai Binh river basin in the context of a changing climate.																			
Deliverables 2: i) Report on the kick-off meeting, stakeholder consultations and site visit ii) Report on the review of challenges and climate change risk to transboundary water resource management in the Hong-Thai Binh river basin iii) Report on the investigation of case studies on the use of different models of data management and sharing for transboundary water resource management at the river basin level iv) Data needs assessment report																			
Output 3: Identification of the most appropriate technologies to provide science-based information on transboundary water resources in the Hong-Thai Binh river basin																			
Activity 3.1: Enumeration and review of the advanced technologies providing water resource data in a transboundary river basin context																			

Based on the data needs assessment and on findings from Activity 2.3, and in consultation with the NDE of Viet Nam and the proponent, the lead implementer will investigate advanced technologies (e.g., tools, models and approaches) that could be applied to bridge gaps identified and provide the necessary data to address water resources management and planning challenges in the Hong-Thai Binh river, including those posed by climate change and by the transboundary nature of this river basin. The lead implementer will be requested to share detailed information about the technologies (including cost and capacity required, in addition to technical specifications), a list of cases where each technology has been adopted and types of water resource data provided by each technology.																		
Activity 3.2: Selection of the most appropriate advanced technologies to be used for providing transboundary water resource data in the Hong-Thai Binh river basin Based on consultations with the NDE of Viet Nam and the proponent, the most appropriate advanced technologies that will be applied to provide transboundary water resource data in the Hong-Thai Binh river basin will be selected. Technologies to be selected through this activity need to provide data for long-term transboundary water resource management planning (10 to 30 years) in the river basin.																		
Deliverables 3: i) Report on the review of the advanced technologies providing water resource data in a transboundary river basin context ii) Report on the selection of the most appropriate advanced technologies to be used for providing transboundary water resource data in the Hong-Thai Binh river basin																		
Output 4: Customization of the selected technologies to provide science-based information on transboundary water resources in the Hong-Thai Binh river basin																		
Activity 4.1: Determination of the scope of intervention of the selected technologies in transboundary water resource management and planning in the Hong-Thai Binh river basin																		

The lead implementer will have consultations with the NDE of Viet Nam, the proponent and relevant stakeholders (e.g., universities and research institutes) to select the data (indicators) on transboundary water resources to be provided through the selected technologies. Data to be provided includes, but is not limited to the following: • Projection of the river water flow (10 years to 30 years) • Average annual river water flow • Seasonal river water flow • Monthly river water flow • 10-day river water flow During the consultations, the lead implementer will be able to propose additional transboundary water resource data (indicators) to be provided through the selected technologies to ensure effective transboundary water resources management and planning, in the context of a changing climate. Once the data (indicators) are selected, the lead implementer will refine methodologies for collecting, processing, storing, monitoring and/or modeling the data on transboundary water resources that are best fit to the Hong-Thai Binh river basin context.																		
Activity 4.2: Establishment of the selected technologies and baseline information in the Hong-Thai Binh river basin The lead implementer will establish the selected technologies for collecting, processing, storing, monitoring and/or modeling the selected transboundary water resource data in the Hong-Thai Binh river basin. By adopting the refined methodologies set up in Activity 4.1, the selected technologies will be customized to be used in the river basin. If needed, the lead implementer will be requested to conduct negotiations with data providers to acquire certain transboundary water resource data (preference will be given to open-sourced data). Once the selected technologies are established, baseline data for the Hong-Thai Binh river basin will be produced, including those for modeling purposes.																		

Activity 4.3: Report and verification of information on transboundary water resources in the Hong-Thai Binh river basin The lead implementer will test data protocols and data management processes, aiming to fine tune/improve the operationalization of the selected technologies for the basin, and will report on the effectiveness of those technologies and any related issues or risks detected (including access to data) and measures to address them, in consultation with the NDE of Viet Nam, the proponent and relevant stakeholders. In addition, the lead implementer will be requested to develop data sharing protocols, testing them to ensure that transboundary water resource data timely generated through the selected technologies is made publicly accessible. The lead implementer will also ensure that the data generated as well as reports on data quality and management issues (including measures taken to address them) is shared regularly for 6 months with the NDE of Viet Nam, the proponent and relevant stakeholders. It is anticipated that an additional dedicated communication process may be established e.g. through the initiation of interactive emailing on a regular basis (twice a month).																	
Deliverables 4: i) Report on the determination of the scope of intervention of the selected technologies in transboundary water resource management and planning in the Hong-Thai Binh river basin ii) Establishment of the selected technologies and baseline information in the Hong-Thai Binh river basin iii) Provision of data sharing protocols, and of the selected transboundary water resource data and reports on data quality and management issues for 6 months (frequency to be determined)																		
Output 5: Capacity enhancement for use of the selected technologies in the Hong-Thai Binh river basin																		
Activity 5.1: Development of the technical manual for use of the selected technologies A technical manual will be developed to ensure that relevant central/local government																		

officials and key stakeholders will be able to use the selected technologies by themselves to generate and use the selected data on transboundary water resources in the Hong-Thai Binh river basin. The lead implementer will be requested to provide the technical manual in both English and Vietnamese in consideration with the level of technical understanding of the relevant central/local government officials and key stakeholders which will be assessed in Activity 5.2 and in the context of transboundary water resources management and planning in the Hong-Thai Binh river basin.																		
Activity 5.2: Capacity needs assessment and development of the capacity building program for use of the selected technologies The lead implementer with support from the NDE of Viet Nam and the proponent will consult with central/local government officials and relevant stakeholders (conducting a stakeholder survey if required) to assess their capacity needs for adopting the selected technologies. Afterwards, the lead implementer will propose a capacity building program for use of the selected technologies, which will include a training component. The lead implementer will be also requested to develop a curriculum for the training program integrating online and face to face sessions to enhance capacity of selected central/local government officials and stakeholders who will use the selected technologies to generate the selected data on transboundary water resources in the Hong-Thai Binh river basin.																		
Activity 5.3: Training of government bodies and stakeholders for use of the selected technologies The lead implementer will organize a training program for central/local government officials and stakeholders (at least 50 participants). By adopting the curriculum developed in Activity 5.2, both online session (half day courses for 4 days) and face-to-face session (3-day courses), co-hosted by the NDE of Viet Nam and the CTCN, will be conducted. The NDE of Viet Nam and the proponent will support the lead implementer in identifying right candidates (participants) in the training program.																		
Deliverables 5:																		

i) Technical manual for use of the selected technologies (in English and Vietnamese) ii) Report on the capacity needs assessment and development of the capacity building program for use of the selected technologies iii) Materials for the training (e.g., training curriculum, presentations, satisfaction survey template, etc.) iv) Report on the training of government bodies and stakeholders for use of the selected technologies																	

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					***4,800***	***7,800***
Activity 1: i) Detailed work plan, ii) M&E plan and impact	*I1: 3 days* *I2: 2 days* *I3: 3 days*				*4,800*	*7,800*

statement, iii) Technical assistance closure report	*I4: 3 days* *N1: 2 days* *N2: 3 days*					
Output 2: Identification of climate change risk and challenges to transboundary water resource management in the Hong-Thai Binh river basin					***35,100***	***47,100***
Activity 2.1: A kick-off meeting, stakeholder consultations and site visit	*I1: 7 days* *I2: 2 days* *I3: 8 days* *I4: 8 days* *N1: 3 days* *N2: 8 days*	*[International travel]* *3 international experts for the duration of 5 days each for the kick-off meeting, the stakeholder consultations and the site visit* *[Domestic travel]* *3 international experts and 2 national experts for the duration of 2 days each for the site visit*	*Kick-off meeting, 10 participants (including women's representative), 1 day* *Stakeholder consultations, 15 participants (including women's representative), 1 day*		*19,000*	*22,000*
Activity 2.2: Review of challenges and climate change risk to transboundary water resource management in the Hong-Thai Binh river basin	*I1: 3 days* *I2: 7 days* *I3: 7 days* *I4: 1 days* *N1: 2 days* *N2: 5 days*				*8,000*	*11,000*

Activity 2.3: Investigation of case studies on the use of different models of data management and sharing for transboundary water resource management at the river basin level	*I1: 3 days* *I2: 1 days* *I3: 7 days* *I4: 7 days* *N2: 3 days*				*6,800*	*9,800*
Activity 2.4: Assessment of data needs	*I1: 1 day* *I2: 2 days* *I3: 3 days* *I4: 1 day*				*1,300*	*4,300*
Output 3: Identification of the most appropriate technologies to provide science-based information on transboundary water resources in the Hong-Thai Binh river basin					***7,400***	***13,400***
Activity 3.1: Enumeration and review of the advanced technologies providing water resource data in a transboundary river basin context	*I1: 2 days* *I2: 2 days* *I3: 5 days* *I4: 5 days* *N2: 2 days*				*4,700*	*7,700*
Activity 3.2: Selection of the most appropriate advanced technologies to be used for providing	*I1: 2 days* *I2: 2 days* *I3: 3 days* *I4: 3 days*				*2,700*	*5,700*

transboundary water resource data in the Hong-Thai Binh river basin						
Output 4: Customization of the selected technologies to provide science-based information on transboundary water resources in the Hong-Thai Binh river basin					***63,300***	***72,300***
Activity 4.1: Determination of the scope of intervention of the selected technologies in transboundary water resource management and planning in the Hong-Thai Binh river basin	*I1: 5 days* *I2: 5 days* *I3: 5 days* *I4: 15 days* *N1: 2 days* *N2: 5 days*				*12,900*	*15,900*
Activity 4.2: Establishment of the selected technologies and baseline information in the Hong-Thai Binh river basin	*I1: 5 days* *I2: 5 days* *I3: 10 days* *I4: 25 days*			*Establishment of the selected technologies*	*33,200*	*36,200*
Activity 4.3: Report and verification of information on transboundary water resources in the Hong-Thai Binh river basin	*I1: 6 days* *I2: 6 days* *I3: 12 days* *I4: 18 days* *N2: 6 days*				*17,200*	*20,200*

Output 5: Capacity enhancement for use of the selected technologies in the Hong-Thai Binh river basin					***44,000***	***53,000***
Activity 5.1: Development of the technical manual for use of the selected technologies	*I1: 3 days* *I2: 2 days* *I3: 5 days* *I4: 8 days* *N1: 2 days* *N2: 5 days*				*8,000*	*11,000*
Activity 5.2: Capacity needs assessment and development of the capacity building program for use of the selected technologies	*I1: 3 days* *I2: 2 days* *I3: 8 days* *I4: 3 days* *N1: 2 days* *N2: 5 days*				*7,200*	*10,200*
Activity 5.3: Training of government bodies and stakeholders for use of the selected technologies	*I1: 8 days* *I2: 4 days* *I3: 12 days* *I4: 12 days* *N1: 8 days* *N2: 8 days*	*[International travel]* *3 international experts for the duration of 6 days each for the training program (face to face session)* *[Domestic travel]* *3 international experts and 2 national experts for the duration of 4 days each for the training program (face to face session)*	*Training program (online session), 50 participants (including women's representative), 2 days (half day courses for 4 days)* *Training program (face to face session), 50 participants (including women's representative), 3 days*		*28,800*	*31,800*

Estimated range of costing for the entire Response Plan	***154,600***	***193,600***

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 environmental engineering, technology and/or management, water 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 water sector, with at least 5 references demonstrating experience in addressing relevant data collection and data management issues. • At least 5 references demonstrating experience in the design and deployment of climate technologies in water sector in developing countries • Experience in organizing capacity building trainings • Previous experience in Viet Nam will be valued. • Excellent written and communication skills in English are required.
Expert in climate change adaptation (I2) (International expert)	The expert in climate change adaptation shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in environmental engineering, technology and/or management, climate technology or an affiliated major • At least 8 years of experience in assessing climate change vulnerability and/or risk and/or planning climate change adaptation in water sector at local, urban and/or national levels • At least 5 references demonstrating experience in the assessment of climate change vulnerability and/or risk and/or climate change adaptation planning in water sector at local, urban and/or national levels in developing countries • Experience in organizing capacity building trainings • Previous experience in Viet Nam will be valued.

	• Excellent written and communication skills in English are required.
Expert in water resource management (I3) (International expert)	The expert in water resource management shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in hydrology, water engineering, technology and/or management or an affiliated major • At least 8 years of experience in planning water resource management at river basin levels, including references demonstrating experience in relevant data management and modeling of water resources • At least 5 references demonstrating experience in planning of water resource management in developing countries • Experience in organizing capacity building trainings • Previous experience in Viet Nam will be valued. • Excellent written and communication skills in English are required.
Expert in water resource monitoring system design (I4) (International expert)	The expert in water resource monitoring system design shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in hydrological modeling or an affiliated major • At least 8 years of experience in designing and/or developing water resource monitoring system at river basin levels • At least 5 references demonstrating experience in the design and development of water resource monitoring system in developing countries • Experience in organizing capacity building trainings • Previous experience in Viet Nam will be valued. • Excellent written and communication skills in English are required.
Gender expert (N1) (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/water sector • Excellent written and communication skills in Vietnamese and English are required. • It is expected that the gender expert will be based in Viet Nam or with the availability to travel frequently and for long periods of time in Viet Nam.
Water resource management expert (N2) (National expert)	The water resource management expert shall have the following expertise and experience: • Master's degree or above (or equivalent experience) in hydrology, water engineering, technology and/or management or an affiliated major • At least 8 years of experience in the field of water resource management in Viet Nam • Demonstrable experience in addressing data challenges in the field of water resource management in Viet Nam • Excellent written and communication skills in Vietnamese and English are required.

	• It is expected that the water resources management expert will be based in Viet Nam or with the availability to travel frequently and for long periods of time in Viet Nam.

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)

Climate change impacts is severe in Viet Nam. The frequency of drought and flood increases, and unusual rainfall pattern and variation in seasonal rainfall occur in the country[8]. In particular, flood season become longer and more extreme in the river basins of the country, including the Hong-Thai Binh river basin.

The exploitation and use of water resources upstream of the rivers (Chinese territory) have significantly influenced water resource management in the Hong-Thai Binh river basin. From a topographical perspective, the Hong-Thai Binh river delta is too low in altitude, and all the delta areas with the infrastructure system are at 3 - 5m lower than the average flood level (5 – 7m lower than the historic flood of August 1971, which was equivalent to a 500-year flood)[9]. Therefore, flood becomes the biggest threat to communities and households in those areas and is also the biggest hindrance in developing the river basin areas.

Climate change and activities in the upstream of the rivers are changing incoming water resources in the Hong-Thai Binh river basin, generating challenges in planning and managing transboundary water resources in the river basin. Outputs from the TA would enable more accurate, integrated planning for transboundary water resource management in the Hong-Thai Binh river basin.

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 Viet Nam for climate change adaptation.

- **Updated Nationally Determined Contribution (2020):** III. Adaptation component - 3.3 Adaptation contributions
  - 3.3.1. Improving adaptation efficiency through strengthening state management and resources (page 20)
  - 3.3.2. Enhancing resilience and adaptive capacity of communities, economic sectors, and ecosystems (page 20)
  - 3.3.3. Reducing disaster risks and minimizing damage, increasing preparedness to respond

[8] Institute of Strategy and Policy on Natural Resources and Environment (2009) Viet Nam assessment report on climate change. ISPONRE.

[9] Van Diep, N., Khanh, N. H., Son, N. M., Van Hanh, N., & Huntjens, P. (2007) Integrated water resource management in the Red River Basin—Problems and cooperation opportunity. In proceedings of the CAIWA international conference on adaptive and integrated water management, Basel, Switzerland (pp. 2-10).

to increasing natural disasters and climate extremes due to climate change (page 20)

- **Technology Needs Assessment (2012):** Chapter 7. Technology prioritization for water resources - 7.3 Result of technology prioritization
  - Table 21 List and assessment of prioritized technology in the water resources sector (page 43): Integrated river basin management

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)

Viet Nam made the first law on water resources in 1998 and revised it in 2012. The law has fundamentally contributed to improving the database and knowledge for efficient and sustainable water resource planning and management, in consideration with climate change impacts in the country. Moreover, research and implementation of technologies to address problems related to water resources have been conducted in the country. Findings and anticipated outcomes from the TA would be linked with the existing efforts on water resource management at river basin levels in Viet Nam.

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, science-based information on transboundary water resources would be generated and used in finalizing a transboundary water resource management plan in the Hong-Thai Binh river basin. Moreover, central government including the Ministry of Natural Resources and Environment (NDE of Viet Nam), with support from NAWAPI (proponent of the TA), could develop and implement programmes/projects to replicate the outputs and outcomes of the TA to other river basins in Viet Nam. The science-based information generated from the TA could be also applied as input data for higher-quality downscaled climate modelling, the results of which could be used in developing a relevant climate adaptation plan and associated strategies/programmes/projects in the Hong-Thai Binh river basin.

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.* Science-based information on transboundary water resources, provided through the TA, could be used in developing a transboundary water resource management plan in the Hong-Thai Binh river basin. In particular, water capacity and availability in the river basin during dry season could be more accurately estimated, and therefore a better plan for water supply to communities and households living in the river basin areas could be made. Moreover, outputs from the TA could improve the capacity of flood monitoring and warning in the Hong-Thai Binh river basin. Proactive actions for flood prevention and impact reduction could be provided to vulnerable groups, including women and youth, living in the transboundary river basin areas, reducing casualties and property damage.

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
Ministry of Natural Resources and Environment *(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
National Center for Water Resources Planning and Investigation (NAWAPI) *(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
North Division for Water Resources Planning and Investigation (NVWATER), NAWAPI	- Consultation about climate change risk and challenges to transboundary water resource management in the Hong-Thai Binh river basin - Consultation about monitoring transboundary water resources in the Hong-Thai Binh river basin
Local government & authorities	- Consultation about climate change risk and challenges to transboundary water resource management in the Hong-Thai Binh river basin

	- Consultation about monitoring transboundary water resources in the Hong-Thai Binh river basin
Vietnam Institute of Meteorology, Hydrology and Thuyloi University	- Consultation about required data and information on transboundary water resources in the Hong-Thai Binh river basin
Viet Nam Water Supply and Sewerage Association	- Consultation about water supply in the Hong-Thai Binh river basin
…	
…	
…	
Ministry of Water Resources, China	- Consultation about sharing data and information on transboundary water resources in the Hong-Thai Binh river basin with Viet Nam

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	
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 identify and customize the most appropriate technologies to provide science-based information on transboundary water resources in the Hong-Thai Binh river basin.
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 the Hong-Thai Binh river basin by providing science-based information on transboundary water resources, which will be used in developing a water resource management plan in the river basin.
	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 a technical manual (or guideline) and a capacity building program to train central/local government officials and relevant stakeholders for effective use of the selected technologies.
	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.