

Localization of water resources management technology to adapt to climate change in the Hong-Thai Binh River basin

Activity 5.2 Report on the capacity needs assessment and development of the capacity building program for use of the selected technologies

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Prepared for UNFCCC Climate Technology Centre and Network, CTCN, as part of the Adaptation Fund Climate Innovation Accelerator





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Acronyms and Abbreviations

AOI	Area of Interest
AR5	IPCC Fifth Assessment Report
AR6	IPCC Sixth Assessment Report
CDSAPI	Climate Data Store (CDS) Application Program Interface (API)
CEWAFO	Centre for Water Resources Planning and Investigation
CFS	Climate Forecast System
CMIP6	Coupled Model Intercomparison Project Phase 6
CTCN	Climate Technology Centre Network
DCC	Department of Climate Change
DEM	Digital Elevation Model
DFS2	2D Data File System
DTM	Digital Terrain Model
EO	Earth Observation
ERA5	fifth generation ECMWF reanalysis for the global climate and weather
ESA	European Space Agency
ESP	Extended Streamflow Prediction
FAO	Food and Agriculture Organization
GCM	Global Climate Models
GFS	Global Forecast System
GHM	Global Hydrological Model
GIS	Geographical Information System
IPCC	Intergovernmental Panel on Climate Change
LAV	Level-Area-Volume
MHB	MIKE HYDRO Basin
NASA	National Aeronautics and Space Administration

NAWAPI	National Center for Water Resources Planning and Investigation
NCEP	National Centers for Environmental Prediction
NDC	Nationally Determined Contribution
NDE	National Designated Entity
NetCDF	Network Common Data Form
NOAA	National Oceanic and Atmospheric Administration
NVWATER	North Division for Water Resources Planning and Investigation
PET	Potential Evapotranspiration
RCP	Representative Concentration Pathways
SAR	Synthetic Aperture Rader
SRTM	Shuttle Radar Topography Mission
SSP	Shared Socioeconomic Pathways
TA	Technical Assistance

Introduction to this Report

This document is a written deliverable of the technical assistance to Viet Nam entitled **'Localization of water resources management technology to adapt to climate change in Hong-Thai Binh River basin'** (reference number AF-2021000099). The proponent and recipient of the Technical Assistance (TA) is the National Center for Water Resources Planning and Investigation (NAWAPI) via its North Division (NVWATER).

This brief report corresponds to Activity 5.2: Capacity needs assessment and development of the capacity building program for use of the selected technologies:

ii) Report on the capacity needs assessment and development of the capacity building program for use of the selected technologies.

It contains two chapters: a brief description of the background of the technical assistance and description of the capacity assessment stage, corresponding to the period where the technical assistance team and the recipients of the system, namely, CEWAFO and NAWAPI, development the training programme.

1 Background

The United Nations has awarded funding to a technical assistance (TA) request to the Climate Technology Centre Network (CTCN1) 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, to ensure more accurate and integrated planning. The main anchor for the technical assistance is the North Division of the National Center for Water Resources Planning and Investigation (NVWATER). The organization delivering the technical assistance is DHI.

The duration of the TA is from April 2022 to October 2023 and the main objectives and outcomes are:

- Identification of climate change risk and challenges to transboundary water resource management in the Hong-Thai Binh River basin
- Identification of the most appropriate technology to provide science-based information on transboundary water resources
- Customization of the selected technology
- Capacity building in relation to the selected technology

This brief report is a result of Activities 5.2 Capacity needs assessment within **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, consists of a separate stand-alone document, which has been delivered to NAWAPI upon the technical training of Activity 5.3 to be revisited after the testing phase and published as a final version during September 2023. The technical manual is in both English and Vietnamese languages.

This report contains the findings regarding technical capacity compiled by DHI over the course of four online sessions with NAWAPI and CEWAFO participants.

2 Capacity Assessment

A series of online demonstrations were carried out during the months of November and December 2022 to keep the technical experts at NAWAPI informed of the progress of works and to collect feedback.

The participants and their institution of origin who took part in the online sessions consist of a group of experts selected by the beneficiaries of the TA, and it is understood the designated future system operators will be amongst the group. The participants are presented in Table 2.1.

Table 2.1 List of participants in online sessions

No.	NAWAPI	CEWAFO
1	Mr. Dung	Mr. Thinh
2		Mr. Trinh
3		Mr. Hung Anh
4		Mr. Hung
5		Mr. Chau
6		Mr. Cong
7		Mr. Binh
8		Ms. Hoa
9		Ms. Hue
10		Ms. Mai
11		Ms. Linh

As a purpose, the demonstration series allowed further interaction between the designated experts and the TA team for answering questions as the technology is developed, while determining knowledge areas in need of strengthening.

The attendees connect to the virtual meeting either from their own computers enabled with video/audio/mic devices, or, as a group from a room provided the room is fitted with the required video, audio and microphone devices to ensure communication between online presenter and participants is possible.

The online series, consisted of 1-hour sessions from 15:00 to 16:00 on the following days:

- 4th November 2022
- 18th November 2022
- 2nd December 2022
- 16th December 2022

Each session began with the demonstration of a selected part of the technology being developed followed by open Q&A forum with the attendees at CEWAFO.

The topics for each session are summarized in Table 2.2

Table 2.2 Topics covered at the online demonstration sessions

#	Topics
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1	Concept of seasonal forecasting as a tool to forecast transboundary flow at the border, using satellite-based input data and the observed data collected at border stations Demonstration of the MIKE Hydro Basin water resources model established for the transboundary catchments
2	Modelling approach of the hydrological forecasting component of the system, the Global Hydrological Model (GHM), and its connectivity to the water resources forecasting component of the system, MHB Hydrological model forcing data and its pre-processing Observation data available and preliminary calibration
3	The operational setup for the hydrological forecasting component: 1. Get forcing data 2. Hotstart handling –pre simulation 3. Simulate rainfall runoff (NAM) 4. Simulate discharge (Routing) 5. Hotstart handling –post simulation 6. Result postprocessing 7. Result import to MIKE Workbench database
4	Review of the hydrological forecasting component with in-depth explanation of results obtained, the resolution of the model grid and catchments and the routing module

It was agreed that participants of the training programme might not have the same knowledge but as a minimum they should have a background with the handling of NAWAPI's modelling software, namely MIKE Hydro River, MIKE Hydro Basin, and MIKE Operation. Participants' background should be technical within the fields of hydrological and water resources modelling, but also programming and remote sensing data.

In discussions with the focal points and accompanying experts, these conclusions were compared with the backgrounds of the trainees that had been selected by NAWAPI. Via an iterative process and direct requests by the focal points, the approach and programme were developed and approved by NAWAPI. The latter are presented in Activity 5.3 report.

3 Next Steps

The next step in the technical assistance is Activity 5.3: Training of government bodies and stakeholders for use of the selected technologies. Alongside the implementation of a four day in-person training programme, it will also produce the following deliverables:

- 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.

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