



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

Activity 5.3 Report on the training of government bodies and stakeholders for use of the selected technologies

Request ID# AF-2021000099



15 August 2023

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 document corresponds to Activity 5.3: Training of government bodies and stakeholders for use of the selected technologies:

iv) Report on the training of government bodies and stakeholders for use of the selected technologies.

This report contains a summary of the background of the technical assistance, followed by the overview and approach followed to develop the training programme. The following sections present the content of the training content with conclusions by the training team and a gender sensitivity analysis carried out by the team's gender expert. The final section indicates what the next steps are in the implementation.

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 report is a result of Activity 5.3 Training of government bodies and stakeholders for use of the selected technologies within **Output 5: Capacity enhancement for use of the selected technologies in the Hong-Thai Binh River basin.**

This report presents the training approach and programme carried out, followed by a gender sensitivity assessment and the next steps in the implementation are indicated.

2 Approach and Overview

The purpose of the training programme developed was to transfer the necessary knowledge to the selected technical experts at NAWAPI in the operation of the transboundary flow forecasting system; to collect feedback and prepare the remaining activities of the technical assistance.

The technology was installed at CEWAFO’s servers on the week of the 6th of March, and the training took place at CEWAFO facilities. The live system was not used for training, therefore, an additional installation package for training purposes only, was prepared and shared with the trainees beforehand. The MIKE software and license were provided and installed in trainees’ PC/laptop to allow them to follow the presentation showed by the trainers, and to practice the given exercises for each of three days in the course.

The training was done almost entirely in Vietnamese, to the exception of opening and closing introductory presentations. The list of attendees was determined by NAWAPI and is presented in Appendix C.

The training programme was implemented over the following period:

- Tuesday 21st of March 8h30-11h30 and 13h30-16h30
- Wednesday 22nd of March 8h30-11h30 and 13h30-16h30
- Thursday 23rd March 8h30-11h30 and 13h30-16h30

Table 2.1 presents an overview of the training programme, designed together with NAWAPI’s focal points and accompanying team of experts, based on their needs.

Each session starts with a presentation followed by Q&A and hands-on exercises in using the operational system.

Table 2.1 Overview of the training programme

	DAY 1 Tuesday 21st	DAY 2 Wednesday 22nd	DAY 3 Thursday 23rd
Morning	Introduction to transboundary flow forecasting Overview of the system components	Recap of previous day Overview of System Operations Introduction to MIKE Workbench managers	Recap of previous day Hands-on exercises: script manager
Lunch break			
Afternoon	Technical manual Lecture on the GHM set up for study area Hands-on exercises: Basin modelling component	Hands-on exercises: Job manager Hands-on exercises: Scenario manager	Wrap-up of training exercises Final Q&A with trainees and official training closure

The detailed agenda is presented in Appendix B.

3 Training Programme

3.1 Participation

Following the discussion between DHI and NAWAPI, the training took place at CEWAFO operational office with participants from departments within NAWAPI, and NVWATER. It was agreed that having had some exposure to such tools would be an advantage for participants. Nonetheless, efforts were put into developing a programme that would also suit beginners through the use of 'step-by-step' training material where trainees are essentially guided through the exercises.

In this TA, the team's gender expert carried out an assessment for the implementation of the training component of the TA. As result of this, NAWAPI has made a balance in terms of gender when preparing trainee's list. It is found that in total of 25 participants, more than 50% of them are women, equivalent to 13 persons. This implies the fact that the need of water forecasting to women is getting higher than the past.

There were 25 trainees to participate in the training, from the following units: NAWAPI, CEWAFO and NVWATER. In which, 5 trainees were from NAWAPI, 16 trainees were from CEWAFO and 4 trainees were from NVWATER. The detailed information is presented in below table.

Table 3.1 Gender split percentages for participants of each institution, number and percentage for male (M) and female (F)

NAWAPI				CEWAFO				NVWATER			
count		%		count		%		count		%	
F	M	F	M	F	M	F	M	F	M	F	M
2	3	40%	60%	7	9	44%	56%	4	0	100%	0%

The number of women and men and percentages for the total number of trainees is presented below.

Table 3.2 Total gender distribution for participants

Count		Percentage	
Female	Male	Female	Male
13	12	52%	48%

3.2 Content

The training was officially opened and closed by Mr. Nguyen Ngoc Ha, Vice Director General of NAWAPI, whose speech is presented in Appendix A, as well as Mr Nguyen Chi Nghia Director General of NVWATER.

For each day, the trainees received sequential knowledge of theory and exercises.

The theory introduction consists of several topics such as weather climate hindcast and forecast, water routing modelling, and integrated system for flow forecasting. A series of exercises had been designed and prepared aiming to help trainees to understand the theory and get familiar with the real-time operational system would be transferred to NAWAPI after the course. At the

end of each session, there was a Question-and-Answer part that helped further discussion on deeper application of innovative technology on water resources forecasting, even on planning.



Figure 3.1 Photograph of the opening speech on the first day of the training programme at CEWAFO operational facilities, NAWAPI

The frequent topics were the development of water resources modelling for China part of the Hong-Thai Binh River basin. Besides, several advanced solutions in the TA were also put on discussion such as theoretical idea behind the GHM system, application of remote sensing in observation of water level in Chinese hydro-power dams where no information is shared. The know-how of similar duplication of this TA to other transboundary river basins in Vietnam was considered.

The sections that follow summarise the content of each training session.

Session 1

The exercise is designed to help the user to become familiar with procedures to operate the rainfall-runoff, and then water resources models within the flow forecasting system.

The users go through each step, from preparation to gathering of rainfall from several sources such as ERA5, GFS and CFS.

Then, the users find out how to simulate the rainfall-runoff model using two of the rainfall sources. The results from the model are the runoff as input to the water resources model. The trainees received the instructions on how to verify the results of simulations. The user has capacity to visualize the hydrograph of runoff in both chart and tabular forms. By plotting a chart, it is possible to find the sudden changes in flow regime, or extreme cases happening between different sources of rainfall. Working with the mapping functionality was also instructed as the good way to identify the distribution of rainfall/runoff over the whole basin of the Red-Thai Binh river.

For each task in this exercise, the user will know how to fetch hydro-meteorological data from the server prepared by the DHI modelling team daily. All the data would be downloaded to the client's server to be used in next step.

The simulation of the NAM model (rainfall-runoff) was the next task practiced by the user. The output of the model is in the forecasting system for external usage later. By default, the result of the NAM model would be stored in the local database for the water resources model (MIKE Hydro Basin).

The second task in the exercise was to be familiar with the MIKE Hydro Basin model. The model is set up, calibrated beforehand and registered inside the forecasting system. For each run, the user needs to call the relevant model, using an appropriate rainfall source to get the outflow at the border of Vietnam. Finally, the user knows how to calculate the indicators of 10 days, monthly, seasonal or percentile transboundary flow depending on the intended purpose.

Session 2

In this exercise, the trainee would be provided with detailed information of how to manipulate the dedicated modules inside the forecasting system. They started by understanding the GIS manager where all the spatial layers and geometry features within the database can be imported, edited, submitted, and illustrated with map viewer of the MIKE Workbench software (comes along with forecasting system). The geometry data can be listed as: river network, catchments, hydro power plants both in China and Vietnam (near border only). The user would be equipped with the knowledge to link geometry data to the timeseries data stored in the system. This is a convenient way to manage spatial/temporal data.

Session 3

The most interesting/difficult topic of the training was imparted in this exercise. Since the participants come from many different backgrounds and working roles, the time for this session was longer than planned. The trainees received the instruction on how to develop a python script from scratch, from a simple function to a complex procedure.

Besides, the user was provided with the standard steps to work with modifications of rainfall-runoff parameters set when needed. By doing this, the user has freedom to improve the model by themselves in the future.

Session 4

The content of this exercise is to help user to understand how to run scenarios. There would be a need in the future to modify the baseline model with new updates in the basin. Within forecasting system, the MIKE Workbench provides a module namely as Scenarios manager which allow user to update, clone, or modify to make new run or simulation. After that, the users can have a chance to compare between several scenarios: baseline, climate change, and variation of water resources planning.

Session 5

In order to make the forecasting system run automatically, there is a Job manager module equipping the system, with fully functional options to set each task to run in sequence, and at a specific time of day. The user has learned how to create a Job (auto run) from scratch, and also from predefined options set up by the DHI project team. The participants had a chance to make a new one and practice their own Job to ensure this knowledge is cemented.

Session 6

This was the final exercise when trainees got used to the system. They could run long term/seasonal simulations and have capacity to look into the forecasts and results to find the required information such as transboundary inflow to Vietnam, releases from reservoirs, water levels at each dam, or rule curves generated by using remote sensing techniques. The participants are enabled to compare simulations versus observations to improve the system in daily work.

3.3 Summary of issues resolved

The training programme was drawn together with NAWAPI and CEWAFO, nonetheless there are several issues raising during the course, summarised below.

Firstly, a key concern was the difference in background of participants. They were from different working groups and consequently had different technical experiences. For example, some of them were familiar with water resources modelling – which would facilitate the application of the modelling component of the seasonal forecasting system – whereas others were unfamiliar with this method. Secondly, when dealing with an operational decision support system such as the output of this technical assistance, having some background in different aspects would ideally be required such as database management and programming, the two aspects which were most challenging for trainees to learn during the training (would require more dedicated and much longer training programme). However, to overcome this challenge, the trainers adapted the programme to fit the requirement and made a commitment to provide further online training support. This is done by local office of DHI group.

Another issue that had to be addressed was the fact that at the time of system installation, NAWAPI and CEWAFO were undergoing hardware refurbishments. The new hardware system that was being installed at NAWAPI consisted of a specific high performance computing system that is not supported by the technology developed. Essentially the hardware environment completely changed at the time of installation.

Additionally, this led to implications on license operation as well, when going from individual server to an HPC server system with a particular configuration. The way licenses and database servers were set up would limit the functioning of the seasonal forecasting system.

Working very closely with NAWAPI, and after several meetings and iterations, it was possible to find a sustainable solution for these issues: DHI provided an additional license with more software modules, without any additional cost.

3.4 Conclusions

A key comment received by participants was that the training was short. A recommendation for more days of training is made for future implementations of technical assistance.

Even participants came from different departments and organisations under the NAWAPI, with different backgrounds, the course aimed for leaving no trainee behind. The programme was intended to allow transferring forecasting solution into the practical work that is being implemented daily, weekly, and for future planning purposes.

The 3-day training was not intended to give the complete detailed inner workings of the developed system to participants. This was also due to the fact that the programme had to be adaptable to the diversified backgrounds of participants as described in the previous sections.

It was found that through the combination of theoretical presentations and step-by-step practical exercises, the trainees could understand the advantages of automated and integrated techniques for the general participation, and it is considered that for the participants consisting of the designated CEWAFO operators, would be able to bring the system into their work. The designated operators will apply their knowledge during the final stage of this TA, the 6-month testing period of the system on real practical water resources forecasting at CEWAFO premises.

It is expected that over the coming 6 months, the designated operators will test, get familiar with, and improve the system altogether with support from DHI to realize the benefits of the developed system in water resources forecasting and planning.

Through the and live training system operation, all participants have received and acknowledge the content of the course. It is considered that, those participants expected to be the designated

system operators, will be able to apply the learned experience to their daily activities. It must be recognised that, those which did not have a background in modelling or data management methods, may not be as effective in retaining the learnings.

4 Gender sensitivity analysis

The training programme implemented was analysed from a gender sensitivity perspective and the results are presented next. The team's gender expert attended the training programme, observed and talked to participants and conducted the survey presented below.

Table 4.1 Survey for the evaluation of the training programme

Questions in Vietnamese (original)	Questions in English (translation)
Anh/chị thuộc đơn vị nào? <ul style="list-style-type: none"> - NAWAPI - CEWAFO - NVWATER 	Which organization do you from? <ul style="list-style-type: none"> • NAWAPI • CEWAFO • NVWATER
Xin cho biết giới tính của anh/chị? <ul style="list-style-type: none"> • Nam • Nữ 	Are you gender? <ul style="list-style-type: none"> • Men • Women
Theo anh/chị, các khó khăn gặp phải khi phụ nữ công tác trong ngành thủy văn và tài nguyên nước là gì?	In your opinion, what are the difficulties faced by women working in hydrology and water resources sectors?
Anh chị vui lòng cho biết các về phần mềm liên quan mà anh/chị đã được học và sử dụng trong các lĩnh vực thủy văn và tài nguyên nước?	Could you please tell us which the related software that you have learned and used in the fields of hydrology and water resources?
Trước khi tập huấn diễn ra, các anh/chị đã cài đặt xong phần mềm này chưa? <ul style="list-style-type: none"> • Đã cài xong • Chưa cài xong • Nếu chưa cài xong là vì lý do gì? 	Before the training, did you install the software yet? <ul style="list-style-type: none"> • Installed • Not yet installed • If not yet installed, why?
Sau 3 ngày tập huấn, anh/chị thấy phần mềm này như thế nào <ul style="list-style-type: none"> • Dễ sử dụng • Khó sử dụng • Bình thường 	After 3 days of training, how do you feel about this software? <ul style="list-style-type: none"> • Easy to use • Normal • Difficult to use
Theo anh/chị, trong quá trình tập huấn phần mềm này thì nữ giới gặp những khó khăn và thuận lợi nào?	In your opinion, during the training this software, what difficulties and advantages do women have?
Theo anh/chị, trong quá trình sử dụng phần mềm này thì nữ giới sẽ gặp những khó khăn và thuận lợi nào?	In your opinion, in the process of using this software, what difficulties and advantages will women have?
Theo anh/chị, trong quá trình tập huấn phần mềm này thì nam giới gặp những khó khăn và thuận lợi nào?	In your opinion, during the training this software, what difficulties and advantages do men have?
Theo anh/chị, trong quá trình sử dụng phần mềm này thì nam giới sẽ gặp những khó khăn và thuận lợi nào?	In your opinion, in the process of using this software, what difficulties and advantages will men have?

Gender sensitivity is the awareness of the social needs, roles and responsibilities of women and men arising from their inherent biological characteristics. At the same time, it is understood that this leads to gender differences in the ability to access, control resources and the level of participation and benefits in the development process of men and women.

A section of the training evaluation survey focused on generating a gender breakdown with regards to different topics. This was used as a tool for the assessment.

In any sectors, gender differences/sensitivity also bring certain advantages and disadvantages. For hydrology and water resources, women face some difficulties as follows: women have to arrange household works/have good health to participate in field trips to survey /measure/ collect information; many complicated works that require long and difficult learning about language barriers make many women are afraid to learn; many models/expertise require long and continuous study time.

Models/software that trainees have been trained and used in hydrology and water resources, which are: WEAP, MIKE BASIN, MIKE ZERO, MIKE NAM, MIKE 11& 21, FOLLOW, MODFLOW, SWAT, MO, WASP, HEC, MIKE RIVER, HECRAS, HEC6, XP STORM, MUSIC, TANK, HydroGis, ArcGIS, Mapinfo, Google Earth Engine. The consultant finds that there is no difference in approach to these models/software, meaning are equally accessible to men and women.

In preparation for the training session, DHI required the trainees to be able to install DHI's software on their computers/laptops. However, 3/18¹ trainees could not finish to install this software before the training. And these 3/18 people are female trainees. The reasons that they did not finish the installation before the training: did not understand the settings related to MO, the time to load data to the personal computer was too long; have to run too many installation files and running *.bat files took longer than expected; data is heavy.

There are 6/18 trainees consider this software are difficult to use after being trained, of which 4/6 are female. In the process of capacity building, women and men face the advantages and disadvantages that are presented in Table 4.2. We find that, in the capacity building process, overall female participants faced more difficulties than male participants.

Table 4.2 Gender breakdown of advantages and difficulties expressed by participants

Advantages	Difficulties
Women	
<p>Know more than the explorers in Mike Workbench to be able to manipulate content to the Mike Operation</p> <p>Women have a more meticulous look and listen attentively</p>	<p>Software is complicated so it is hard to learn</p> <p>When learning the Script part because this is the part needs to use the open source of Python code to run the command</p> <p>Not fluent in computers, the operations for the programming part are not fast</p> <p>Using instructions to connect in MO is quite new, so it is difficult to reach this part</p> <p>Need to invest more time to learn about the model</p> <p>The code (script part) because there is no basic</p>
Men	
<p>Quick operation in software</p>	<p>The software also manages quite a variety and many content categories, so it is necessary to</p>

¹ Consultant received 18/25 feedbacks on the survey questionnaire.

Advantages	Difficulties
<p>Men have preference for software as well as programming languages to manipulate in software</p> <p>Can be faster when applying to real problems</p>	<p>improve expertise to use it at the right time and in the right place. In addition, this MO system requires a server system and software license to operate. So common difficulty is that after learning, there must be a practice system to understand and manage the system better. If learning is only practiced and familiarized in a short time, it is difficult to understand, apply and develop to other similar areas.</p> <p>Complex software, in terms of code and language</p>

As a final remark, it is very relevant to point out that the designated system operators, who had the best suited background and who have been following the system development from the start happened to all be male.

5 Next Steps

The remaining activities consist of a testing phase lasting until the end of September, during which the trained experts will use the system on their own and report back to DHI any issues encountered. A testing protocol was developed for that effect. Finally, the last month of the technical assistance is October 2023, where any issues found will be resolved and a final project closure meeting will be held.

Appendix A Official opening speech

Ladies and Gentlemen!

Dear all trainers and trainees!

First of all, I warmly welcome and wish good health to all the participants and delegates who attended the training course on the trans-boundary flow calculation for the Hong-Thai Binh river basin.

The CTCN project on "Localization of water resources management technology to adapt to climate change in Hong-Thai Binh river basin" has been implemented during the development of the Integrated Planning of the Hong – Thai Binh River Basin. The purpose of the Project is to support the Integrated Planning of the Hong – Thai Binh River Basin in calculation of trans-boundary flows by selected technology, thereby improving the quality, efficiency and comprehensiveness of the integrated management of water resources, contributing to water-related damages mitigation, and strengthen the capacity in climate change adaptation through early forecasting and warning and readiness in response to frequent water-related emergencies and disasters in the future.

Up to now, after 6 months of implementation of the project, with the urgent and serious work of DHI's experts, the technology for trans-boundary flow calculation of the Hong-Thai Binh river basin has been basically completed.

The objective of this training course is to help participants understand the rainfall-runoff forecasting system based on the Global Hydrological Model (GHM) developed by DHI through lectures on data management, operating mathematical models, adjusting calculation scenarios through Mike Workbench. The results of the trans-boundary flow calculation are extracted as input for the models inside Viet Nam.

During the training-, it is recommended that the trainees raise their sense of responsibility, attend all the sessions to fully absorb the training contents presented by the DHI experts; frankly discuss unclear issues, limitations and inadequacies of the system in order to clarify issues of mutual concern with experts, accumulate experience and learn useful things.

As for all the staff of the Center for Water Resources Warning and Forecast, I would like all comrades with a sense of responsibility and eagerness to learn more so that the sessions can be fully absorbed, and to operate and test the system transferred by DHI to directly serve the water resources warning and forecasting task and effectively supports the post-planning monitoring work.

The target audience of this training course is from many different backgrounds and ages, from which the acquisition level is also somewhat limited. Therefore, it is suggested that experts who explain the topics should use simple, easy-to-understand words, convey all the contents of the topics of the training class so that trainees can operate the system when applying it in practice.

I would also like to thank the DHI experts for arranging their time, work and preparing training materials carefully for today's training session.

Once again, I wish you good health. Wish our training class effective and successful.

Appendix B Workshop Agenda

DAY 1		
Purpose: introduction to the transboundary flow forecasting system, understanding the rainfall/runoff and basin modelling components, introduction to MIKE Workbench		
Time	Title	Responsible
8:30	Welcome and introductions Opening remarks by NAWAPI, CEWAFO.	NAWAPI
8:40	Introduction to the Forecasting System <ol style="list-style-type: none"> 1. Approach and methodology 2. Weather forecasting 3. Flow forecasting 4. Q&A with participants 	DHI (SLS)
09:00	Introduction to MIKE Workbench <ol style="list-style-type: none"> 5. GIS manager 6. Spreadsheet manager 7. Time series manager 	DHI (NNB)
09:30	Exercise 1 <ol style="list-style-type: none"> 8. Rainfall-runoff modelling outputs 9. Basin modelling outputs 10. Q&A with participants 	DHI (NNB)
11:30	Lunch break	
13:30	Exercise 2 Explore and understand system outputs: <ol style="list-style-type: none"> 11. Prepare maps with associated time series for a selected area of interest 12. Q&A with participants 	DHI (NNB)
16:30	End	

DAY 2		
Purpose: hands-on exercises in using the different MIKE Workbench managers		
Time	Title	Responsible
8:30	Recap of previous day	DHI (NNB)
8:40	Exercise 3 <ol style="list-style-type: none"> 13. Script manager 14. Generate a script that generates climate change precipitation time series based on baseline climate 	DHI (NNB)
11:30	Lunch break	
13:30	Exercise 4 <ol style="list-style-type: none"> 15. Scenario Manager 16. Produce two climate change scenarios and run the simulations 17. Generate two plots comparing results to a selected baseline simulation 	DHI (NNB)

16:30	End	
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DAY 3		
Purpose: system operations and hands-on exercises using the job manager, final Q&A with trainees and official training closure.		
Time	Title	Responsible
08:30	Recap of previous day	DHI (NNB)
09:00	Overview of system operations 18. Introduction to the job manager 19. Overview of the list of jobs making up the system and their scheduling	DHI (SLS)
09:30	Exercise 5 20. How to create a new job 21. Observe the jobs generated for the system operators 22. Key aspects of operations and Q&A	DHI (NNB)
11:30	Lunch break	
13:30	Exercise 6 23. Create a job that runs the planning model using upstream model results as boundaries 24. Generate plots and tables that allow inspection of results 25. Analysis of results obtained	DHI (NNB)
16:00	Next steps Testing stage and closing of the technical assistance.	DHI (SLS)
16:15	Final remarks and closing	NAWAPI
16:30	End	

* DHI (NNB) – Nguyen Ngoc Bach; DHI (SLS) – Sílvia Leirião

Appendix C Attendance Register

#	Name	Position	Institution	Relevant skillset	Gender	Phone	Email
1	Vu Thi Hai Ha	Staff - Department Sci. Tech. and Int' Cooperation	NAWAPI	Digital Transformation	Female	0398893896	vuhaiha0810@gmail.com
2	Dinh Tien Dung	Staff - Department Planning	NAWAPI	MHB, MHR	Male	0944483533	dungdt812@gmail.com
3	Nguyen Minh Huy	Staff - Department Planning	NAWAPI	MHB, MHR	Male	0915797187	nmhuy153@gmail.com
4	Tran Thi Huong	Staff - Department Planning	NAWAPI	MHB, MHR	Female	0961992846	tranhuong211192@gmail.com
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6	Hoang Thu Ha	Lead - Department Warning and forecast in the North side	CEWAFO	MO	Female	0904253739	hoangthuha51180@gmail.com
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