FLOOD & DROUGHT MANAGEMENT TOOLS

Technical Training: Volta Basin (Basin) Report

25-27 September 2018

Water Resources Commission (Conference Room)

Accra, Ghana

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1. Executive summary

The increasing frequency and unpredictability of floods and droughts is now a priority concern across scales from transboundary to local, along with the other multiple drivers that cause depletion and degradation of shared water resources. This is increasing the sense of urgency around the need to improve resilience within river basins, and for this to become a critical part of water management plans.

The Flood and Drought Management Tools (FDMT) project (http://fdmt.iwlearn.org/) is developing online technical applications which can be applied individually or together at the basin or local level to facilitate the inclusion of information about floods, droughts and future scenarios into Integrated Water Resources Management (IWRM) planning, Transboundary Diagnostic Analyses (TDA) and Strategic Action Plans (SAP), and Water Safety Planning (WSP). The project is being implemented from 2014 - 2018, and 3 pilot basins (Volta, Lake Victoria and Chao Phraya) are participating in development and testing. It is funded by the Global Environment Facility (GEF) International Waters (IW) and implemented by UNEP, with the International Water Association (IWA) and DHI as the executing agencies.

The Flood and Drought (FD) Portal (www.flooddroughtmonitor.com) is the main output of the project and has a series of technical applications supporting stakeholders to carry out baseline assessments using readily available satellite data, impact assessments through the analysis of the data, planning options and a means for disseminating information to relevant groups or individuals. Understanding how to use these tools is an important aspect of the future operational use and sustainability of the FDMT project, therefore, capacity on the use and application of the flood and drought portal, as well as giving stakeholders an opportunity to provide feedback on the functionality of the portal will go a long way to achieving this.

The project held a technical training targeted at water resource professionals within the Volta Basin to test the tools and methodology developed with the objective of:

- Enhancing stakeholders understanding of the tools on the FD portal
- Providing the stakeholders with an opportunity to give feedback on the functionality of the tools on the FD portal
- Refining the development of the FD portal and the associated tools based on stakeholder feedback

The training demonstrated the use of the project outputs on a use case focusing on strengthening the planning on the Volta Basin with focus on climate variability and climate change. It also focused on the currently developed outputs and the outputs to be delivered through the project as a whole were introduced as well.

Institutions represented at the training included: Volta Basin Authority (VBA), Ghana Water Company Limited (GWCL), Water Resources Commission (WRC), Volta River Authority (VRA), Hydrological Services Division (HSD), GMET, Agence de l'Eau du Gourma, and Agence de l'Eau de Nakambé

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2. Project background

There is a growing sense of urgency around the need to improve resilience within river basins, and for this to become a critical part of water management plans. The increased frequency and unpredictability of floods and droughts is a priority concern across scales from transboundary to local, along with the other multiple drivers that cause depletion and degradation of shared water resources.

The Flood and Drought Management Tools (FDMT) project (http://fdmt.iwlearn.org/) is funded by the Global Environment Facility (GEF) International Waters (IW) and implemented by UNEP, with the International Water Association (IWA) and DHI as the executing agencies. The project is developing online technical applications[1] which can be applied individually or together at the basin or local level to facilitate the inclusion of information about floods, droughts and future scenarios into Integrated Water Resources Management (IWRM) planning, Transboundary Diagnostic Analyses (TDA) and Strategic Action Plans (SAP), and Water Safety Planning (WSP). The project is being implemented from 2014 - 2018, and 3 pilot basins (Volta, Lake Victoria and Chao Phraya) are participating in development and testing.

Understanding how to use the technical applications is an important aspect of the future operational use and sustainability of the FDMT project, therefore, capacity on the use and interpretation of the tool and their outputs, as well as giving stakeholders an opportunity to provide feedback on the functionality of the tools will go a long way to achieving this.

The project has been holding a series of technical trainings targeting technical staff and junior to senior level water resource professionals from key project stakeholder. Trainings intend to provide a basis for bringing the basin organisations and relevant basin level authorities, and water utilities together around a planning tool, while being able to test and validate the technical content of tools. Feedbacks from the trainings are integrated into the development and refinement of the tools.

The objectives of the technical trainings are to:
- Enhance stakeholders understanding of the methodology and tools developed under the FDMT project
- Provide stakeholders with an opportunity to give feedback on the technical content of the tools
- Refine the development of the methodology and tools based on stakeholder feedback

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[1] The term tools and technical applications are used interchangeably. Tools in this context are defined as the technical applications being developed by the project and are available at http://www.flooddroughtmonitor.com/home

3. Technical training

3.1 Overview of training

Technical trainings on the use of the tools are scheduled on a yearly basis throughout the project phase within each of the pilot basins. The technical trainings provide capacity building as well as an opportunity for different stakeholder groups (e.g. water utilities and basin organisations/water agencies) to give feedback on the functionality and use of the developed tools to date. The feedback is included in the further development and refinement of technical content of the tools.

See Annex 1 for the agenda.

The sessions for the training in Accra presented the developed functionality to date, using real data from the Volta Basin. Other tools available in the Flood and Drought portal (http://www.flooddroughtmonitor.com) were also introduced to the participants.

Objective
The objective of the technical training was to:
- Enhance stakeholders understanding of the methodology and tools developed under the FDMT project
- Provide stakeholders with an opportunity to give feedback on the technical content of the tools
- Refine the development of the methodology and tools based on stakeholder feedback

Expected outcome of the workshop
The expected outcome of the technical training was for key stakeholders to understand the functionality, how to use the tools, and how the output from the tools could be used in decision making around flood and drought management and planning.

For the project, it was also an opportunity to gather valuable feedback on the functionality and how the developed tools could be used in decision-making.

Target group
The target group of the technical training was water resource professionals from organisations working in the Volta Basin (See Annex 2 for full participant list).

3.2 Technical training

3.2.1 Training materials
All presentations, step-by step guides and additional material were made available for the training. The material was used to assist participants on the use of the portal and relevant technical applications.

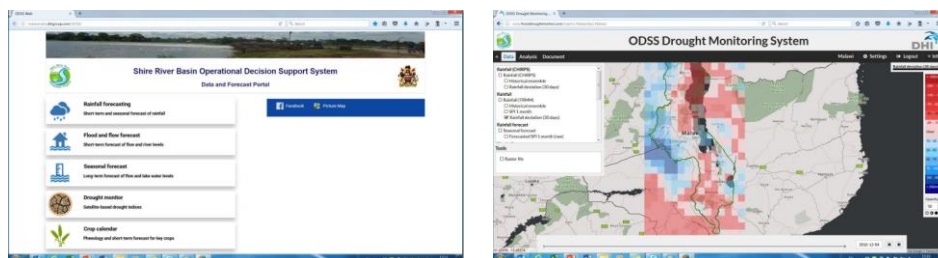*all material (presentations, step-by step guides, etc.) can be accessed here.*

Day 1. Project overview, FDMT project.
Tuesday, 25 September, 2018

The first day started with a welcome address and an overview of the workshop and FDMT project. This was followed by a presentation on status of the ongoing Flood & Drought project with a view of updating participants on the current status of the project.

This was followed by a presentation of an existing project in Malawi that is making use the F&D tools to support forecasts and decisions various agencies and stakeholders. The project, titled **Operational Decision Support System (ODSS)** is being implemented in the Shire Basin in Malawi to enhance

productivity and reduce climate risks through timely warnings and also provide access to information. Lessons learnt from the project were discussed by participants together with a sustainability plan to guide the various organisations present on institutional roles towards the sustainability of similar projects.

Web interface and display of data of the ODSS

The afternoon section mainly focussed on discussions on the challenges and expectations after the end of the project. Participants were assured that the project would continue to support organisations for the next five (5) years and also promised to do their best to take into accounts some of the challenges discussed.
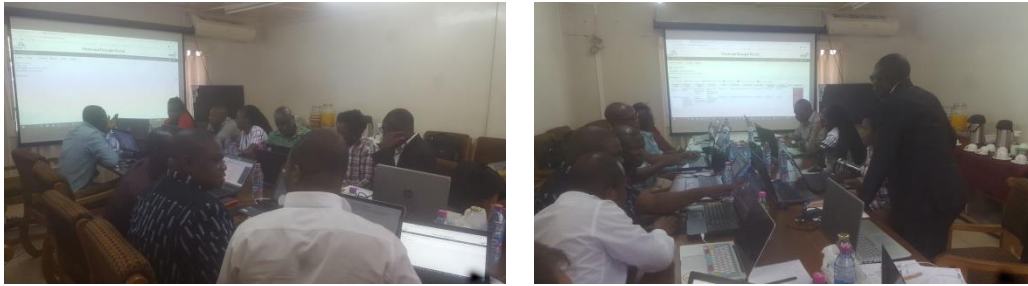
Day 2. Issue Analysis, indicators and Data and information
Wednesday, 27 June, 2018

The second day of the training began with a presentation on the Issue Analysis application. This application enabled participants to analyse environmental issues and the causes behind the impacts from these issues. This application uses the Causal Chain Analysis (CCA) method to identify the immediate, underlying and root causes behind the impact and the Water Resource Issues Assessment Method (WRIAM) to evaluate the key issues and prioritize the environmental impacts based on the a rapid assessment. Participants were later divided into groups of four (4) and each group explored the application by identifying some environmental issues from their region and assessed their impacts using CCA and WRIAM methods. Some issues identified were siltation of rivers, metal pollution, displacement of people and flooding.

The water Indicator application was later demonstrated to participants as a library of indicators that provides information about the indicators, their relevance and how they can be used for planning and decision making. Default frameworks have been developed which users can use as a starting point when developing their own framework for their respective organisations, users are also able to start from scratch. The link between the issue analysis and the water indicator application was displayed to participants as this allows users select appropriate indicators to measure the environmental issues identified. From the issues identified during, participants identified some indications to measure the issues from the default framework. They also explored how to add and remove indicators.

The final session of the day provided an overview of the Data and Information application where participants learned of the available near real time data for flood and drought assessment in the portal. This was done through hands-on exercises that introduced participants to the functionality and the different data types.

Group discussions and exercises by participants

Day 3. Crop application, Flood assessment and basin planning
Thursday, 27 September, 2018

The third day was preceded by a reflection of the second day followed by an introduction of the Crop application tool within the portal. This application seeks to support the assessment of impacts related to the agriculture sector by identifying major crop season/information as well as estimating crop water requirements for selected basins. Participants explored the application through hands on exercises to better understand how the crop model could be used to forecast drought impacts on crops, including the uncertainty of the climate forecast in the assessment.

The next presentation was on the Flood Assessment tool. This application introduced participants to some flood index that can assist in planning for floods e.g. the effective flood index (EFI), Height Above Nearest Drainage point (HAND). A rainfall-runoff model was also presented to show the impact of climate vulnerability and change on historic runoff. Participants explored the application in their various groups with specific examples from the Volta Basin.

The Basin application was later introduced to participants as a tool that can assist in planning to improve conditions in a particular basin by simply looking at the current or past condition and based on this evaluate how the condition could be improved. Participants were taken through how to create new plans as well as view existing plans. An existing plan on the Nkambe basin was used as a guide to in explaining to participants for better understanding.

Towards the end of the day the Drought Assessment tool, and Reporting tool were briefly explained and participants were asked to explore the applications and send feedback or any questions to the project coordinates for any assistance.

The day ended with the closing of the workshop by the executive director of VBA and presentation of certifications of participation to all the participants who attended the training.

Some participants receiving certificates taken at the closing ceremony at the end of the training on the third day

3.3 Next steps

The project is almost completed and all the applications are being finalized based on feedback from participants. Learning materials and guidance documents will be provided to users. Tutorials, videos and a user guide will provide the required information on the tools to enable users to build their capacity around the use of the technical applications. You can view all training material form the training [here](#).

The knowledge portal (http://www.flooddroughtmonitor.com/knowledgeportal/) is expected to serve as a platform for users to interact with other users through the online discussion boards and also provide relevant material and information about all the available application through the online courses.

Upon the project completion, there will be continuous support to users for the next five (5) years to ensure better uptake of the methodology and technical applications.

Group photo of participants

Annex 1 – Agenda

Technical training – Day 1

Introduction to the drivers or causes behind flood and drought, use of indicators to measure the state of specific causes and overview and knowledge of relevant data.

Time	Item
09.00-09.30	Registration
09.30-09.45	Welcome and presentation of the objective with the technical training
09.45-10.00	Presentation of participants
10.00-10.30	**Status of the ongoing Flood & Drought project** Outcome: Objective and current status of the project.
10.30-13.00	**Flood and Drought – impact and causes** *Identify and prioritize the key environmental impacts from drought and flood using a Chain Causal Analysis and WRIAM approach* • Group work based on the Issue Analysis app. • Discussion on the identified and prioritised causes. Outcome: Identification of prioritised impacts and the underlying causes of flood and drought events in Lake Victoria region.
13:00-14:00	*Lunch*
14.00-16.00	**Indicators – assessing the state through indicators** *Identify relevant indicators for measuring the state of the causes for flood and drought in the Lake Victoria region.* • Group work based on the Water Indicator app. • Identification of relevant indicators for the key underlying causes behing flood and drought. Outcome: Identification of indicators and the required data for assessing the state of flood and drought.
16.00-16.45	**Flood and Drought – data** *Overview and understand available near real time data for flood and drought assessment.* • Hands-on exercises – based on the Data and Information app. • Basic introduction to the functionality and the different data types. Outcome: Knowledge and understanding of available data to be used for flood and drought assessment.
16.45-17.00	Discussion and wrap up

Technical training – Day 2

Focus on drought assessment, how to disseminate information from the system to stakeholders and details on drought indicators of relevance for the Lake Victoria region.

Time	Item
09.00-09.30	Reflection and follow up on day 1
09.30-13.00	**Drought indicators** *In depth understanding of key indicators to be used for drought assessment in Lake Victoria.* • Hands-on exercises – how key indicators could be used for drought assessment. • Specific examples from the region.

	Outcome: Capacity and knowledge to use key indicators for drought assessment in the region.
13:00-14:00	*Lunch*
14.00-15.00	**Drought – crop impact and uncertainty in forecast** *Understand how a crop model could be used to forecast drought impact on crops. Include the uncertainty in the climate forecast in the assessment.* • Hands-on exercises – use and setup of the agro application. • Introduction and use of the RDM application. Outcome: Capacity and knowledge to evaluate the impact on the crop production from drought events in Lake Victoria.
15.00-16.45	
16.45-17.00	Discussion and wrap up

Technical training – Day 3 Focus on flood assessment as well as basin planning.	
Time	**Item**
09.00-09.30	Reflection and follow up on day 2
09.30-11.00	**Flood assessment** *In depth understanding of indicators for flash flood potential as well as available data for flood assessment.* • Hands-on exercises – flash flood warning and assessment. • Specific examples from the region. Outcome: Capacity and knowledge to use key data and tools for flood assessment in the region.
11.00-13.00	**Basin planning – introduction** *Introduction to basin planning and assessment of investments and changes in a basin.* • Introduction to the planning application. • Hands-on exercises – bases on cases from the region. Outcome: Practical understanding on application of basin planning in the region.
13:00-14:00	*Lunch*
14.00-15.30	**Basin planning continued**
15.30-16.00	Discussion and wrap up

Annex 2 – Participants

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