FLOOD & DROUGHT MANAGEMENT TOOLS

Technical Training: Lake Victoria Basin (Utility) Report

22-24 May 2017

The Vic Hotel

Kisumu, Kenya

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1. Executive summary

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 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.

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 therefore held a technical training targeted at technical staff and junior to senior level water resource professionals from Kisumu Water and Sewerage Company (KIWASCO), Mwanza Urban Water Supply & Sewerage Authority (MWAUWASA) and National Water and Sewerage Corporation – Jinja Region (NWSC – Jinja Region), as they are the key stakeholders identified in the Lake Victoria Basin for testing the tools and methodology developed.

The purpose of the training was to provide a basis for bringing water utilities together around a common planning tool with a special focus on Water Safety Planning, while being able to test and validate the technical applications (tools) available on the FD portal. Feedback from the workshop is being gathered and will be included in the final development and refinement of the tools in the FD portal.

The objectives of the technical trainings are to:
- Enhance stakeholders understanding of the tools on the FD portal
- Provide the stakeholders with an opportunity to give feedback on the functionality of the tools on the FD portal
- Refine the development of the FD portal and the associated tools based on stakeholder feedback

The training in the Lake Victoria Basin held in Kisumu, Kenya was a 3 day training from 22-24 May 2018 with representatives from the water utilities in Kisumu (Kenya), Mwanza (Tanzania) and Jinja (Uganda).

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.

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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 training provides 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.

The technical training provides a basis for bringing water utilities around a common tool which can assist in planning considering information on floods, droughts and future scenarios. The training in Kisumu was a 3 day training from 22-24 May 2018 (see Annex 1 for the agenda) with representatives from the water utilities in Kisumu (Kenya), Mwanza (Tanzania) and Jinja (Uganda).

The training sessions reflected the developed functionality to date, using real data from the Lake Victoria Basin.

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 is 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 is the technical staff within the water utilities, junior to senior level professionals as recommended by key stakeholders (see Annex 2 for full list of participants).

3.2 Technical training

The training is for technical staff and will focus on the capabilities and potential uses of the methodology and tools developed in the FDMT project with a special focus on Water Safety Planning (WSP). There will also be opportunities to explore other tools such as issue analysis, water indicator, and data and information. The training is a combination of lectures and hands on exercises, where the exercises will contain relevant issues within Thailand.

This technical training is the final water utility training on the tools from the Flood and Drought Management Tools project, however there is still the opportunity for follow up and refresher training until the end of 2018.

The following section will provide a brief overview of each day.

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

Day 1. Project overview, FDMT project, issues and indicators
Monday, 16 April, 2018

The training opened with a welcome address and an overview of the workshop and FDMT project. A brief presentation on the status of WSP implementation considering climate change scenarios was presented by each utility (presentations are available in the training document). This was followed by a presentation on general functionality of the Flood and Drought Portal (see Figure 1) with an exercise on setting up working groups. The working groups concept seeks to ensure that information is kept confidential or only shared with a specific group of users.
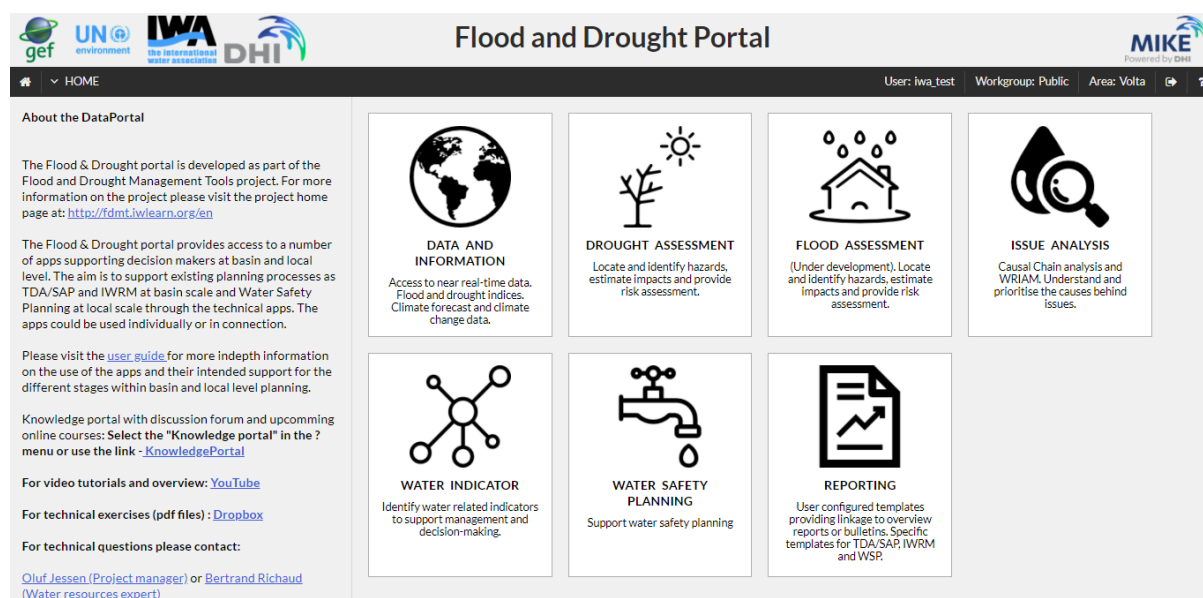

Figure 1. Flood and Drought Portal

The issue analysis application was presented by participants during the morning session. The application aims at analysing environmental issues and the causes behind the impacts from the environmental issues. The application is based on 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) is used to evaluate the key issues and prioritise the environmental impacts based on the a rapid assessment. Participants explored the application by identifying common environmental issues faced in their utility and assessed their impacts using the CCA and WRIAM methods. Some issues identified by participants were community conflict, non-revenue water, eutrophication, pollution of the catchment and flooding due to heavy rains.

Towards the end of the day, the water indicator application was demonstrated to participants. The water indicator application is a library of indicators providing information about the indicators, the relevance of the indicator and how it 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. Also the issue analysis has been linked to the water indicator application to allow users select appropriate indicators to measure the environmental issues identified. An opportunity was given to participants to test and explore the link between the two applications as well as provide an impression of how to add and remove indicators.
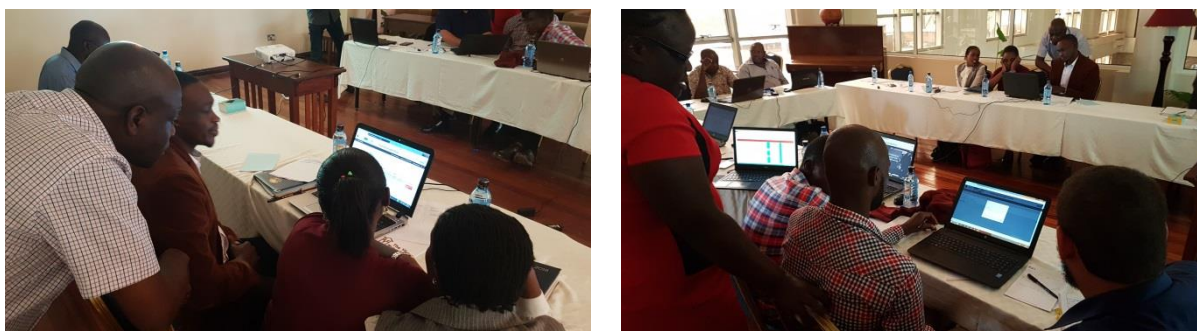
Figure 2. Group work

Day 2. Data and Information Application and WSP
Tuesday, 16 April, 2018

Day 2 focused on the Data and Information application which provides users with access to near real-time satellite data (freely available). The application provides climate information such as rainfall, temperature, information about flood and drought indices, climate hazard, climate forecast and climate change. With the onset of climate change, historical weather patterns which most utilities largely depend on to gauge future water supplies is expected to be disrupted bringing about uncertainty. For this reason, utilities need to understand how climate change affects water supply whiles ensuring continued supply to consumers. The information from this application can be used to inform long-term planning in which climate change impacts can be considered. There were demonstrations on the Flood and Drought Portal on how to display the climate information and discussions on how to interpret such data together with how it can be applied by the water utilities.

The Water Safety Planning Application was introduced to participants to explain how the project is supporting utilities with their development and implementation of water safety plans (WSP) within the context of climate change and water utility resilience. As part of the Flood and Drought Portal, a water safety planning supporting application has been included for development and documentation of the WSP process. The application is the main entry point for water utilities.Through the application, water utilities are prompted to think about climate change impacts on their supply system and for hazard identification in order to ensure their WSP are climate resilient.

The application supports the 11 modules (steps) identified in the WSP manual (http://www.wsportal.org/what-are-water-safety-plans/), each representing a key step in the WSP development and implementation process. Each module contains a brief overview and provides assistant for each key step on the development of the WSP.

Participants then had the opportunity to follow a webinar, in which Kizito Masinde (IWA) was invited as a panelist to share his experience around WSP by the Water Institute at UNC.

Figure 3. WSP webinar

The group ended the day with discussion on how to apply climate data in long-term planning and if such information provided by the Data and Information application is currently being used for asset management and planning. This was also an opportunity for participants to share what other types of climatic data (not water quality) is needed to identify hazards. Some other data sets identified included vegetating cover, water discharge, evapotranspiration, soil type, number of wet days, heat wave (hot air) (some of these indicated data sets are currently available in the application).

Day 3. Water Safety Planning and reporting
Wednesday, 17 April, 2018

Day 3 was spent exploring the support provided to the 11 Modules of the WSP approach. Participants went through exercises inputting information in the WSP application. The idea was to also integrate what participants learned over the past 2 days into the WSP process (e.g. thinking about climate change impacts on hazard identification and risk rating).

The reporting application concluded the training. Reports are critical for easily disseminating technical information in a more accessible way. The application allows users to generate automated reports (defined by the user) addressing key issues such as drought status, flood status, WSP status, etc.

Figure 4. Group photo (utility representatives and trainers)

3.3 Next steps

The project is in its final stages and all the applications are being worked to completion 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.

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.

Once all the applications are completed, the focus of the remaining time will be on consultation to ensure better uptake of the methodology and technical applications.

Annex 1 – Agenda

22 May 2018 – Day 1: Full day

Time	Item
09:00-09:10	Welcome and introduction
09:10-09:30	Overview of workshop and FDMT project

09:30-10:30	General functionality of the Flood and drought Portal
	 • 3 Presentations – WSP implementation in a context of climate change and future changes
	     - KIWASCO (20 mins)
	     - MWAUWASA (20 mins)
	     - NWSC - Jinja (20 mins)

10:30-11:00	*Break*
11:00-12:30	General functionality of the Flood and drought Portal
12:30-13:30	*Lunch*
13:30-15:00	**Flood and Drought – Causes and impact** Presentation: Issue analysis application *Exercise 1: Identify and prioritise the key environmental impacts from flood and drought events within the utility*
15:00-16:00	**Assessing the state with indicators** Presentation: Water indicator application *Exercise 2: Identify relevant indicators for the underlying causes of flood and drought in the region*
16:00-16:30	*Break*
16:30-17:00	Wrap up and expectations for Day 2

23 May 2018 – Day 2: Full day

Time	Item
09:00-09:10	Recap of Day 1 and reminder of expectation for Day 2
09:10-09:30	**Data and Information** Presentation: Climate overview *Exercise 3*
09:30-10:30	Presentation: Climate hazard (temperature and rainfall) *Exercise 4*
10:30-11:00	*Break*
11:00-12:00	Presentation: Rainfall forecast *Exercise 5*
12:00-13:00	*Lunch*
13:00-14:00	Presentation: Climate change *Exercise 6*
14:00-15:00	**Water Safety Planning and supporting application** Presentation: Climate resilient WSP and WSP supporting application
15:00-15:30	*Break*
15:30-17:00	**WSP Webinar**

24 May 2018 – Day 3: Full day

Time	Item
09:00-09:10	Recap of Day 2 and reminder of expectation for Day 3
09:15-10:15	**Water Safety Planning supporting application** *Excercise7: Module 1 (assembling the team)*

10:15-10:30	*Exercise 8: Module 2 (design the supply system)*
10:30-11:00	*Exercise 9: Module 3, 4, 5 (Hazards, control measures and improvement plans)*
11.00-11.15	*Break*
11:15-12:30	*Exercise 9 (continued)*
12:30-13:30	*Lunch*
13:30-14:00	*Exercise 10: Module 6,7,8 (Monitoring, verification and management procedures)*
14:00-14:30	*Exercise 11: Module 9,10,11 (Supporting programmes and reviews)*
14:30-15:00	**Reports and bulletins** Presentation: Reporting application Link with WSP
15:00-15:30	*Break*
15:30-16:30	Wrap up (next steps)

Annex 2 – Participants

First Name	Organisation	Email
Staff		
Kizito Masinde	IWA	Kizito.Masinde@iwahq.org
Raul Glotzbach	IWA	Raul.Glotzbach@iwahq.org
Utility participants		
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Annex 3 – Evaluation form

Evaluation of Flood and Drought Management Tools Technical training

Name: **Organisation:**

What was your overall impression of the training?

Excellent ☐	Good ☐	Acceptable ☐	Below expectations ☐
Comments:			

General	Too high		Acceptable		Too low
How did you find the technical content of the course?	1	2	3	4	5
	Agree				Disagree
There was sufficient hands-on support during the training	1	2	3	4	5
Comments (specifically on the technical level of the training):					
	Too long				Too Short
The duration of the training was…	1	2	3	4	5
The time for discussions and group work was…	1	2	3	4	5
The time for hands-on use of the tools was…	1	2	3	4	5
Comments (specifically on length of the training and time provided to do each exercise):					

Presentations and demonstration of Flood and drought management tools	Agree				Disagree
I have a good overall understanding of the Flood and Drought Management Tools project and what it is trying to achieve	1	2	3	4	5
The presentations of the Flood and Drought Portal and the technical applications were clear and understandable	1	2	3	4	5
The demonstration of the Flood and Drought Portal and the technical applications were clear understandable	1	2	3	4	5
The written guidance and exercises for the Flood and Drought Portal and the technical applications were clear understandable	1	2	3	4	5
What could be improved and made clearer when presenting and demonstrating the tools?					
Which tool are you likely to use and how?					

Would you use the climate data presented in the data and information tool? How would you use this data?

Exercises and group work	Agree				Disagree
The exercises for each of the tools were easy to follow	1	2	3	4	5
The exercises helped increased my understanding of the technical applications	1	2	3	4	5
I feel that I will be able to use the technical applications after the training	1	2	3	4	5

What did you like or not like about the exercises for the tools?

What could be improved and made clearer?

Course practicalities	Agree				Disagree
The venue was satisfactory	1	2	3	4	5
Lunch and refreshments were satisfactory	1	2	3	4	5
The training was well organised	1	2	3	4	5
I received practical information well in advance	1	2	3	4	5

Comments:

Annex 4 – Feedback

<u>Utility training</u>

General						*n*	*12*
	Response						
Questions	**Excellent**	**Good**	**Acceptable**	**Bellow Expectation**			
What was your overall impression of the training	7	4				*n*	*11*
Comment	. Intermittent connectivity . Hands on training; appreciated integration for climate change in WSP . Very interesting especially the presentation about climate and drought . The material and presentations were very good . Well organized training . The training was very engaging						
	Too high		**Acceptable**		**Too low**		
	1	**2**	**3**	**4**	**5**		
How did you find the technical content of the course?	2	6	4				
	Agree				**Disagree**		
	1	**2**	**3**	**4**	**5**		
There was sufficient hands on support during the training	6	4	1		1		
Comment	. Need further training on the modules as only the basics were handled. . Very impressive and cannot wait to have the next one . Technical content was good as it was able to achieve its desired support . Well organized . Some aspects may have been slightly rusted						
	Too long				**Too short**		
	1	**2**	**3**	**4**	**5**		
The duration of the training was...			9	1	1	*n*	*11*
The time for discussion and group work was...		5	5	1		*n*	*11*
The time for individual hands-on exercises was...	1	3	7			*n*	*11*
Comments (specifically on length of the training and time provided to do each exercise)	. The training was okay. Most exercises were accomplished within the specified time . Sufficient enough to be continued . The time was just enough for the exercises given . The training took 3 days with 2-3 hours for each exercise . Time not quite enough . Sufficient time was provided						

Presentations and demonstrations of flood and drought management tools						*n*	*12*
	Response						
Questions	**Agree**				**Disagree**		
	1	**2**	**3**	**4**	**5**		
I have a good overall understanding of the Flood and Drought Management Tools project and what it is trying to achieve	6	4	1			*n*	*11*
The presentations of the Flood and Drought Portal and the technical applications were clear and understandable	6	5	1				
The demonstration of the Flood and	5	5	2				

Drought Portal and the technical applications were clear understandable					
The written guidance and exercises for the Flood and Drought Portal and the technical applications were clear understandable	6	4	2		
What could be improved and made clearer when presenting and demonstrating tools?	. Connecting the climate into the real WSP work . How to interpret the data and relate it to WSP . Need to improve on the network issues. Network goes off in the middle of work . Some of the identified fields need to be confidential . Add more presenters for exercise support				
Which tool are you likely to use and how?	. WSP - During reviews and staff induction and stakeholder awareness . WSP tool . The WSP tool. We are already incorporating it in our systems . FDMT to relate to climate change and improve on data analysis . WSP tool to help improve our WSP in the utility . Data and information tool. Use of predictive data for planning as well as WSP to mitigate and implement controls . WSP and data information . Flood and drought tools . All tools				
Would you use the climate data presented in the data and information tool? How would you use this data?	. Yes. To inform and decide on planning and changes . Yes, for planning purposes to guide operation within the technical department . Yes, I would use the climate data, for example in analysing the raw water quality . It would help in monitoring raw water quality and chemical effectiveness for known contaminations . Yes, it helps in planning for operations especially rainfall and temperature data . By planning water control measures . Yes, for asset management and planning for upcoming fiscal year . Yes, in planning for infrastructure and water quality planning . Yes, I would use the climate data presented in the information tool as it would help in predicting, planning and decision making . For monitoring purposes . Yes, to predict severity and intensity of droughts				

Exercises and group work						*n*	*12*
Questions	**Response**						
	Agree				**Disagree**		
	1	**2**	**3**	**4**	**5**		
The exercises for each of the tools were easy to follow	4	7	1				
The exercises helped increased my understanding of the technical applications	8	2	2				
I feel that I will be able to use the technical applications after the training	6	4	1			*n*	*11*
What did you like or not like about the exercises for the tools?	. Be informed to carry computers to use in class . I liked the presentation on climate and floods . I like the presentation spatial data and graphs . It helped in understanding the tools better and understanding how to use it . The exercises were good and cooperative . Use of temporal and spatial date was an added advantage . It needs skilled people						
What could be improved and made clearer?	. Work book or notes to carry along back home . Communication about the training content i.e. If a computer is required for the exercise . The flood and drought portal. Sometimes data/information you have filled in does not show after filling it in . Add unit levels for the climate parameters						

	. The templates for WSP to be improved (verification) . Add ore exercise, training days and add more participants . Strong availability of internet during presentation and exercises . It enabled me to have a better understanding on the use of the tools and appreciate the use of spatial data . Simplify the tool functions

Course practicalities *n* *12*

Questions	Response				
	Agree				**Disagree**
	1	**2**	**3**	**4**	**5**
The venue was satisfactory	8	3	1		
Lunch and refreshments were satisfactory	9	2	1		
The training was well organised	8	3	1		
I received practical information well in advance	4	4	4		
Comment	. Pre-send topics/content of what to be covered . Training content should be sent in advance so that the team can adequately prepare and have their expectations met . The training was very beneficial. Look forward for more trainings to come. Thank you . I look forward to improvements in the next opportunities . The training has improved my understanding of the tools . Training should come closer to more expertise to the institutional areas rather than train few people . I recommend also the course be conducted at the water utility to involve most of the ground staff . A well organised workshop . It was generally good, learnt a lot of new topics				