



INTERNATIONAL WATERS EXPERIENCE NOTES

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Stakeholder engagement to develop applications for flood and drought planning



The Flood and Drought Management Tools (FDMT) project provides a decision support system (DSS) in the form of online tools accessed through a portal for transboundary basin organisations and water utilities to better cope with climate variability and the effects of climate change, especially floods and droughts. The Flood and Drought Portal (www.flooddroughtmonitor.com) offers a series of technical applications and a methodology to support existing planning approaches such as transboundary diagnostic analysis (TDA), strategic action programmes (SAP), integrated water resource management (IWRM), and waster safety planning (WSP).

DSSs often suffer from low uptake in practice, as the intended users may not be included in their inception, design and later stages. The FDMT project has employed a user-centered approach in designing, training and awareness-raising activities. The project has worked alongside pilot basin stakeholders from Volta, Lake Victoria and Chao Phraya basins and has sought input from a diverse range of stakeholders in the regions at every development stage.

A combination of engagement strategies have been used including: Face-to-face individual meetings and group meetings; skype follow-up calls; face-to-face trainings and workshops; participatory opportunity mapping for extending engagement and promotion in the region, etc. Developing a targeted engagement strategy with tailored messaging and activating local champions to promote the tools and support resources to a wider audience is key to overcoming the difficulties of stakeholder buy-in; language barriers and future sustainability.

Flood & Drought Management Tools

Stakeholder engagement process to develop online applications to support flood and drought planning

Experience of the GEF - sponsored

GEF/UN Environment/DHI/International Water Association: Flood and Drought Management Tools
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PROJECT DESCRIPTION

Flood and drought events are becoming increasingly common, more severe and less predictable. Climate change is a major driver, but a growing global population, urbanisation, changing land use, and increased demand for water from competing sectors, are putting pressure on an already limited resource: water.

There is a growing sense of urgency around the need to improve our ability to recognise and address flood and drought risks, and to improve resilience and cooperation within river basins and amongst end-user. Land, water and urban area managers can better prepare for water related risks by integrating information on flood and drought events into planning and analysis processes.

Recognising the growing need, the Flood and Drought Management Tools (FDMT) project, fdmt.iwlearn.org, has developed an online portal - Flood and Drought Portal (www.flooddroughtmonitor.com) - with technical applications (also referred to as tools) to assist land, water and urban area managers operating in transboundary river basins to recognise and address flood and drought impacts, including their increasing magnitude, variability and unpredictability. The applications can be applied individually or together to incorporate information on floods, droughts and future scenarios into existing planning processes across scales, namely Transboundary Diagnostic Analyses and the subsequent development of Strategic Action Programmes, Integrated Water Resources Management (IWRM) and Water Safety Planning (WSP).

FDMT users have access to satellite data to support baseline assessments; a platform to analyse data to support impact assessments and formulate planning options; and the ability to disseminate information from applications in the portal (see Figure 1). In short, the FDMT project is developing an online platform for basin organisations and

local users (specifically water utilities) involved in the planning and management of flood and drought afflicted water basins. To ensure greater uptake and relevance of the final technical applications, stakeholder engagement from the design stage through to final launch has been integral to the project. Figure 2 describes the stakeholder engagement process, wherein stakeholder feedback is essential to move between stages of development. This experience note will focus on this engagement process and the different engagement tactics employed throughout.

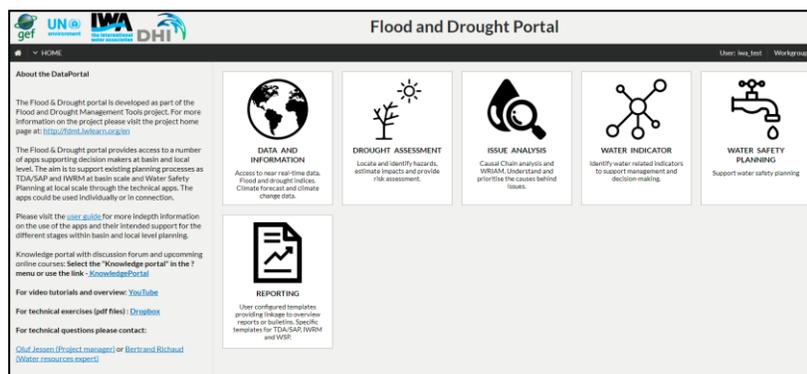


Figure 1. Flood and Drought Portal interface

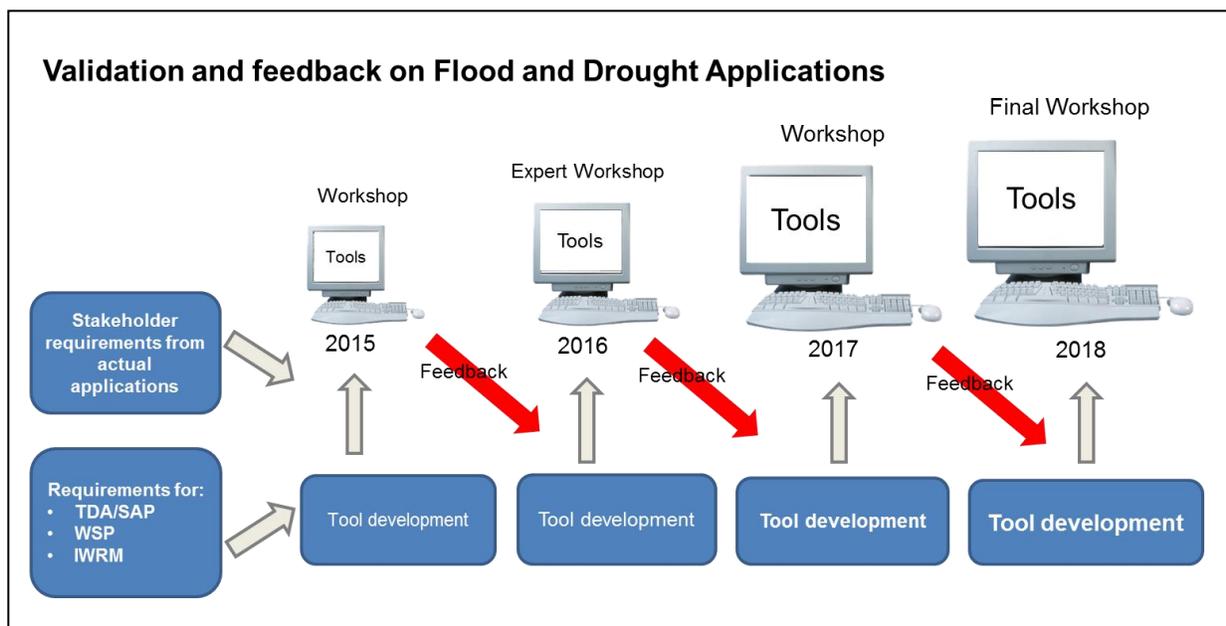


Figure 2. Process for stakeholder engagement for FDMT applications

THE EXPERIENCE

Issue

A Decision Support System (DSS) is usually a computer-based information system that supports business or organisational decision-making activities. It can range from a basin spreadsheet to a complex system with models running in the background. DSSs are useful instruments for water resources management. In the case of the FDMT project, the DSS is an online portal – The Flood and Drought Portal – with a set of technical applications to address floods and droughts.

A multitude of actors operating at different levels of governance, have to negotiate and make decisions to effectively manage their shared water resources. A DSS can help with providing, organising and analysing information that can inform these decisions. There is a growing understanding that those intended to use and benefit from a DSS must be involved in their design to ensure relevance, quality and wider uptake (Sandink et al., 2016; Zhang et al., 2013). There is no specific standard for stakeholder engagement to enhance the effectiveness of a DSS, so this needs to be tailored to each context.

A range of stakeholders were engaged in the development and design of the Flood and Drought Portal. The FDMT project has attempted to do this based on various engagement strategies with stakeholders from the pilot basins - Volta Basin, Lake Victoria Basin and Chao Phraya Basin. This experience note focuses on showcasing the different stakeholder engagement strategies used to respond to user requirements for designing and developing the online portal.

Addressing the Issue

A tailored approach to engagement was essential from the initial project scoping stage and has shaped the entire development of the FDMT project. It is important to develop a strategy to prompt interest from target organisations and establish relevance for the use of the technical applications early

on. Basin organisations have an established interest in IWRM and transboundary water management issues, so this becomes the key attractive feature for how the applications can be integrated in their work. Whereas, the point of engagement for gaining the interest of water utilities has been through supporting Water Safety Planning, which has become the predominant risk management approach for water utilities to ensure drinking water quality.

Due to the geographical spread of the pilot organisations and the international facilitation team behind the FDMT project; different styles of engagement were employed to ensure that stakeholder feedback was collected on a regular basis. For example, as IWA has a presence in Bangkok, face-to-face consultations were possible on a regular basis. DHI has a number of projects in each of the basins so they have used these as a mechanism for engagement beyond the existing trainings and other events. For stakeholders in the Volta and Lake Victoria basins, in-person group workshops were combined with individual follow-up consultations via skype.

Table 1 below outlines the various mechanisms that were used to enable input into the design and development of the technical application. This included stakeholder consultation from inception and a continuous process of feedback through testing and discussions.

Table 1. Overview of stakeholder engagement in the FDMT project

Stakeholder engagement step or strategy	Description
Inception phase stakeholder consultations	A series of consultation events were organised during the inception phase of the project with over 50 stakeholders. Consultations consisted of a series of workshops and focused interviews with the purpose of carrying out an initial needs assessment to inform the development of a methodology to support planning for flood and drought events in transboundary basins.
Technical workshops	Capacity building is an integral part of the FDMT project and valuable activity for stakeholders. The technical trainings offer an opportunity to demonstrate the functionality of technical applications. Feedback from the training are useful for further refinement and development of the technical applications, offering the project a means of validating the applicability and relevance of the tools for transboundary basins.
Awareness workshops	Tailored workshops showcasing the applicability of the tool in providing more coordinated preparedness and planning for floods and droughts. The project relies on the key stakeholders to further advocate the benefits of the project outputs. LVBC, for example, have helped promote the project and the outputs at their Regional Policy Steering Committee meeting and Council of Ministers meeting.
Virtual updates	Regular calls are organised to provide an update on progress within the project. Calls focus on technical developments and opportunities for continued engagement. The calls are also an opportunity for stakeholders to ask questions and present relevant initiatives they are engaged in.
Showcasing at various events (demonstration, presentations)	The project has also been participating in international and regional events and supporting the participation and contribution of key stakeholders in workshops and sessions.
Project steering committees	Yearly meeting with key project stakeholders (basin representatives and additional resources persons), providing guidance to the FDMT project.
Webinars	Webinar series focusing on innovative approaches to Floods and Droughts planning and management for basins and water utilities (supported by the UNEP DHI collaboration center) – fdmt.iwlearn.org/en/webinars . The webinars targeted water practitioners of all levels, including policy-makers, technical staff and water managers, as well as water educators, with the aim of giving insight to the role that innovative approaches can play in supporting floods and droughts management at all scales; from basin to catchment, water utility and industry levels.
Online (on demand) learning resources	User guide, YouTube channel with tutorials and demonstrations of tool functionality, online resource hub with newsletters, factsheets, presentations,

	reports and the website is regularly updated with new information and relevant resources.
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There are 3 areas that are important to highlight where stakeholder engagement has been effective:

A) Regular consultations and integration of stakeholder feedback

In an effort to get stakeholders involved right from the early design stage, during the inception phase (first 6 months) consultations were held with basin organisations, water management authorities and water utilities in each pilot basin. This served to begin the design process of the FDMT platform, gauging needs, desired functionalities based on stakeholder type (basin organisation or utility) and responsibility. As the technical applications developed, feedback collected at regular stakeholder consultations via workshops, conferences, meetings, stakeholder update calls have improved the relevance of the technical applications and methodology and refined the finalised tools. Along with specific project workshops, the project has also been participating in relevant international events with a wide array of stakeholders from different basins. Feedback from these events has also been integrated into later stages of the technical applications.

A noteworthy example was based on stakeholder feedback and experiences; the decision was made to adapt the desktop DSS which was based on Mike Basin to a more user-friendly portal with a series of technical applications that can be used individually or in a workflow where information from one application can be used in another. There are trade-offs in this approach as it does not allow tailoring of the applications to a specific basin. However as the aim was to have something that could be used across transboundary basins, the online solution was deemed more accessible and suited for this requirement.

B) Technical trainings, awareness events& learning resources

Technical trainings consisted of workshops demonstrating the tools, and participants going through exercises including use cases to see how they worked and how they could apply to their context. This process enabled feedback from over 90 people who participated in technical trainings across all 3 pilot basins. The content of technical trainings has been tailored for each set of stakeholders to not only provide feedback but also encourage the uptake and use of the technical applications after the project ends. As the applications are finalised on the job trainings have been organised to specifically apply the technical applications within an organisation. For example, the project team is carrying out regular training of WSP teams in selected water utilities across the pilot basins to see how they can best use and integrate the WSP support tool and use climate data from the Data and Information tool to identify climate hazards and their associated risks to the water supply system.

The technical trainings targeted those that are dealing with the daily management of water resources or those involved in risk management. To target decision makers, the project held awareness workshops and events which focused on the issue of integrating data and information into planning, and the process of coordinating preparedness for floods and droughts. The tools were showcased as one way to do this but other approaches were also discussed. The aim of the technical training and awareness events was to ensure buy-in and ownership across organisations from management to operations.

An additional tool to support training and continued learning is the Knowledge Portal: www.flooddroughtmonitor.com/knowledgeportal/. The portal was set up to provide users with a forum for users to ask question around use of the technical applications. . Users can also use the portal as a learning resource to access a number of online training materials to support unsupervised use of the tools to further improve their capacity. The project is also developing webinars, tutorial videos and how to guidelines for each technical application.

C) Resources to support wider uptake of FDMT beyond pilot basins

A communication plan was developed for the project to align the communication efforts from the consortium partners and provide guidance for how the project aims should be communicated and how best to enhance awareness amongst a wide range of stakeholders. The communication plan supports the development of all the different mediums for communication (e.g. videos, posters, infographics, fact sheets, web content, etc.). It has been important to consider the different needs and responsibilities of the stakeholders in each pilot basin to ensure that communication materials are relevant.

Disseminating information and resources to a wider audience beyond the pilot basins is also important to support wider uptake ensuring the sustainability factor. This has formed part of the aim behind promoting the project at international events, to trigger greater awareness of the value of the Flood and Drought Portal.

As a strategy to increase outreach the project completed a mapping exercise, involving stakeholders, to identify events, trainings, conferences which could increase visibility of the project and diversify feedback. As part of this exercise, defining and identifying strategic and tailored messaging for different groups of stakeholders has been important to effectively promote the project outputs and the potential use of the technical applications. For example, the project has taken the opportunity to showcase the tools at previous editions of the [IWA World Water Congress](#) and the recent [IWA Water and Development Congress](#) (see Figure 3).



Figure 3. The Flood and Drought Portal was demonstrated at the recent IWA Water and Development Congress in Buenos Aires

RESULTS AND LEARNING

A) Regular consultations and integration of stakeholder feedback

An improved understanding of user needs, existing water management strategies and tools and basin resources has emerged from continuous consultations with stakeholders. Two important outcomes of the stakeholder engagement feedback loop approach have been: (1) re-orientation from a desk-top based DSS to the online Flood and Drought Portal and (2) development and validation of a series of technical applications relevant to the stakeholders.

It is not always straightforward to collect feedback on the tools and methodology as there are requests that are often beyond the project scope along with competing priorities. Ensuring that balanced feedback is received from stakeholders is reflective of the engagement strategy. From the beginning and through the project development phase, it is important to remember that stakeholders will have different interests and will have different capacities to use and integrate the project outputs into decision-making. For example, stakeholder buy-in has been low in some of the pilot basins along with low in-house technical capacity. In response to these challenges and over the remaining project lifespan, closer working relationships are being nurtured with the relevant stakeholders through targeted trainings and greater

outreach efforts to engage high-level decision-makers and activate champions that can promote the tools. Furthermore, there is a constant need to revisit the engagement strategy to refine tailored communication and ensure that they are meaningful for the target stakeholders

B) Technical trainings, awareness events & learning resources

Continuously increasing the awareness and benefits of improved risk management for floods and droughts is part of working with stakeholders to actively learn how to use and apply the tools themselves. Building capacity to integrate the tools into planning and operations has been the main focus of the final stage of the project in the pilot basins. Part of this is developing guidance on how the technical applications and the information they provide can be practically used. For example, guidance is being developed on how water utilities can interpret and use climate data and information for identifying climate hazards and incorporating these into water safety planning.

It is also important to reflect on who participates in workshops and trainings. Continued application of the tools is unlikely if those who attend the workshops and trainings do not share what they learn with their colleagues and peers or leave the organisation. This has been part of the aim of the awareness events to sensitize organisation leadership and move towards institutionalisation of climate data and information as part of planning. There have been successes in stakeholders investing resources to share the project tools and methodology. For example, the Thai partners, the Hydro and Agro Informatics Institute (HAI) have worked with the project to extend training within and outside Thailand to other agencies. The project is also actively engaging with the World Health Organization (WHO), Nile Basin Initiative (NBI), Emanti Management Group, and the International Association of Water Supply Companies in the Danube River and Catchment (IAWD) to integrate some of the online applications into their own initiatives. For example, IAWD has indicated interest in integrating the WSP tool into their training and advocate for wider use of the tool within their membership.

Additional feedback from stakeholders beyond the pilot basins was also valuable (e.g. experts in water safety planning from WHO, Water Futures and the Emanti Group). Presenting the portal at different workshops and events allows insight into how the applications might be used in other settings.

C) Resources to support wider uptake of FDMT beyond pilot basins

Project sustainability is crucial to ensure continued benefits from the project outputs. Currently, pilot stakeholders can use an online user manual that they can access from the Flood and Drought portal. More detailed resources are being made available to support users with varying capacities and needs, and also how to use the applications in practice. Support resources include:

- Individual guidelines for each online application
 - Detailed step-by-step guidelines that outline how to use the application
 - Guidance notes which provide information on how to apply the application in practice, how to understand the outputs of the application and integrate the outputs into their planning
- Videos that provide a more visual and interactive support resource
 - Video tutorials developed from the training workshops and guides on the technical applications

It is important to note that once the first draft of each additional support resource is reviewed internally, it is circulated among project stakeholders for their feedback.

REPLICATION

The aim of the project has been to develop a global DSS that is adaptable to different contexts. This was a requirement of the project by the GEF and has the benefit of ensuring sustainability of the usage and relevance of the project outputs. Allocating time and resources for capacity building remains a key component to flexibly address differing capacities throughout the engagement strategy and ensure sustainable uptake of project outputs. Furthermore, linking the FDMT project to upcoming projects and initiatives that involve an implementation phase will ensure greater sustainability. For example, the IWA is collaborating with OFID and WHO on climate resilient water safety planning where the applications can be used to identify climate hazards impacting the utility and the WSP tool can support decision-making and planning. DHI has a number of active projects where the tools are being applied. This includes incorporation into an Operational Decision Support System in Malawi, as part of the Zambezi water resources information system enhancement, and as part of the Lakes Edward and Albert Basin Plan , among others.

Developing a global technical tool comes with other challenges, for example:

- Stakeholders with differing technical capacities will interpret outputs differently
- Language barriers can limit effective engagement between stakeholders and project facilitators
- Pilot basins are engaged on a voluntary basis which can limit their engagement and buy-in
- Different histories of transboundary water management and implementation of climate adaptation, impacts capacity, interest and local relevance

It is through offering greater supporting resources; triggering local champions and experimenting with different engagement strategies that these challenges can be met. The project has had some success at meeting these challenges by ensuring stakeholder engagement and input has been at the centre of the work.

SIGNIFICANCE

The FDMT project is unique in that it has been specifically designed to support GEF IW develop of tools to incorporate impacts of climatic variability and change into planning across scales from transboundary to end users such as water utilities. Furthermore, this is the first documentation within an experience note explicitly around a stakeholder engagement process into the design of a DSS.

This experience note highlights a critical challenge for all funded projects within the water sector: How do we ensure sustainability of project outcomes? This is particularly relevant for a DSS, as uptake and integration into planning and management tends to be low across most environmental DSS (Sandink et al., 2016), although water management DSSs are quite common, such as in Australia (Delfau, 2017) or Spain (Zhang et al., 2013). Lessons learned from the FDMT project will be important for the development of future DSS platforms as well as their application.

Climate change will continue to be a major concern of this century impacting stakeholders within transboundary basins. As future initiatives, projects or programmes are developed, stakeholders affected should have a voice in the design and implementation, as initiatives, projects or programmes ultimately influence their planning to address climate change impacts.

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KEYWORDS

- ◆ Stakeholder engagement
- ◆ Floods
- ◆ Droughts
- ◆ Transboundary basin
- ◆ Transboundary water management
- ◆ Planning

Visit fdmt.iwlearn.org for FDMT project reports, communication material and support & learning materials (webinars, training material, application guidelines, support videos).

Visit www.flooddroughtmonitor.com to register and log-in to the technical applications.

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