

## FLOOD AND DROUGHT MANAGEMENT TOOLS APPLICATION FOR BASIN ORGANISATIONS



Climate change is projected to significantly affect the water cycle, altering rainfall patterns and water flow and exacerbating extreme events such as floods and droughts. For sustainable planning and management of water resources, basin organisations must use scientifically sound information in their decision making processes to respond to these changes.



Planning approach overview

### Improved planning in a changing climate

River basins worldwide are already experiencing the negative impacts of climate change with more frequent, uncertain and severe flood and drought events, intensified erosion and sedimentation, increased water scarcity, reductions in glaciers and snow cover, sea level rise, and damage to water quality and ecosystems. Transboundary river basins have the additional challenge of sectors and countries competing for water resources. Decision making and planning is often unilateral, jeopardising the sustainability of the basins.

Processes such as Integrated Water Resources Management (IWRM) and the Global Environment Facility's (GEF) Transboundary Diagnostic Analysis/Strategic Action Programme (TDA/SAP), have been introduced to help basin organisations carry out more coordinated and integrated strategies aimed at a sustainable water resource management.

IWRM is a planning process coordinating the development and management of water, land and related resources, while ensuring economic, social and environmental sustainability. The TDA provides an analysis of the state of the basin and the root causes for its degradation. The SAP outlines the actions needed to resolve priority threats to international waters identified in the TDA. These planning processes are used by GEF to identify priorities for investment in a basin. The planning approaches enable provide a means to carry out a baseline assessment, assess the impact of climate change, develop planning options and a means for disseminating information to relevant groups or individuals.

The Flood and Drought Management Tools (FDMT) project is funded by the Global Environment Facility (GEF) International Waters (IW) and implemented by UN Environment (UNEP), with the DHI and the International Water Association (IWA) as the executing agencies. The project is developing a package of web-based technical applications (tools), accessible through the Flood and Drought Portal. The tools can be applied individually or together to include information about floods, droughts and future scenarios into planning from the transboundary basin to water utility level. The project is being implemented from 2014 - 2018, and 3 pilot basins (Volta, Lake Victoria and Chao Phraya) have been identified for development and testing of the methodology and technical applications.

## Basin level partners



**The Volta Basin Authority (VBA)** is a trans-boundary basin management organisation promoting the implementation of integrated water resources management. VBA authorises the development of infrastructure and projects proposed by its stakeholders, which contribute to poverty alleviation and the sustainable development of countries within the basin.



**The Lake Victoria Basin Commission (LVBC)**, established by the East African Community in 2001 to coordinate interventions in and around the lake and its basin. LVBC serves as a centre to promote investment and information sharing among various stakeholders.



**The Hydro and Agro Informatics Institute (HAI)** operates under the umbrella of the Ministry of Science and Technology, with the responsibility of developing and applying science and technology to support better agricultural and water resource management practices.

## Integrating floods and droughts into planning

With the frequency and severity of flood and drought events increasing, there is a growing need for basin managers to recognise and better plan for the impacts on human welfare, ecosystems and economic development. The planning process facilitates collaborative opportunities with water users across a basin to identify sustainable measures for managing water resources.

Planning processes, such as TDA/SAP or IWRM, provide a portfolio of actions to be adopted by relevant authorities and stakeholders for a more coordinated approach to the development and management of basin water resources (e.g. protecting a water source, ensuring sustainable water infrastructure etc.). The FDMT project is supporting operational and strategic planning processes by providing scientifically sound information on floods and droughts. Operational planning is short term planning (weeks to a few years) with the objective of reducing impacts without investing in new infrastructure. Strategic planning is planning based on a vision or objective covering a longer time period. This will typically include investments in infrastructure to cope with future changes.

## Flood and Drought Portal

The FDMT project is developing a methodology with technical applications (tools) to incorporate information about floods, droughts and climate change into planning. The methodology provides stakeholders with access to a package of web-based tools through the Flood and Drought Portal. The tools can be used individually or together to incorporate information about floods and droughts and likely future scenarios into planning. The approach is being tested and validated with basin and water utility stakeholders.

The screenshot shows the 'Flood and Drought Portal' website. It features a navigation bar with logos for GEF, UNEP, IWA, DHI, and MIKE. Below the navigation bar, there is a grid of eight tool categories, each with an icon and a brief description:

- DATA AND INFORMATION:** Access to near real-time data. Flood and drought indices. Climate forecasts and climate change data.
- DROUGHT ASSESSMENT:** (Under development). Locate and identify hazards, estimate impacts and provide risk assessment.
- FLOOD ASSESSMENT:** (Under development). Locate and identify hazards, estimate impacts and provide risk assessment.
- ISSUE ANALYSIS:** Causal Chain analysis and WWSM. Understand and prioritise the causes behind issues.
- WATER INDICATOR:** Identify water related indicators to support management and decision-making.
- BASIN PLANNING:** (Under development). Create and evaluate basin plans. Linkage to water resource model.
- WATER SAFETY PLANNING:** Support water safety planning.
- REPORTING:** User configured templates providing insight to overview reports or bulletins. Specific templates for TDA/SAP, IWRM and WSP.

Flood and Drought Portal

The approach is being tested and validated with basin and water utility stakeholders. The portal provides valuable support in choosing management options at a basin level e.g. zoning, early warning systems and infrastructure. It also helps stakeholders develop a forward-looking approach through strategies that are robust, resilient and pragmatic.

## Engaging at the basin level

The FDMT project is testing and validating the methodology and tools with stakeholders across three pilot basins (Chao Phraya, Lake Victoria and Volta). For transboundary planning, the key stakeholders are basin organisations, with other institutions, e.g. electricity companies, catchment organisations, irrigation and environmental agencies, collaborating to provide key links between basin and local level planning.

As the umbrella institution for basin-wide water resource management, basin organisations are well positioned to influence decision making, to regulate the use of resources and promote more coordinated initiatives. Their engagement in the project is crucial in ensuring high level buy-in, and their knowledge on the basin is invaluable for continued implementation of the project applications.

The project also provides an opportunity for improved basin and local level collaboration.

**Project website: [fdmt.iwlearn.org](http://fdmt.iwlearn.org)**

**Flood & Drought Portal: [www.floaddroughtmonitor.com](http://www.floaddroughtmonitor.com)**

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