

FLOOD & DROUGHT MANAGEMENT TOOLS



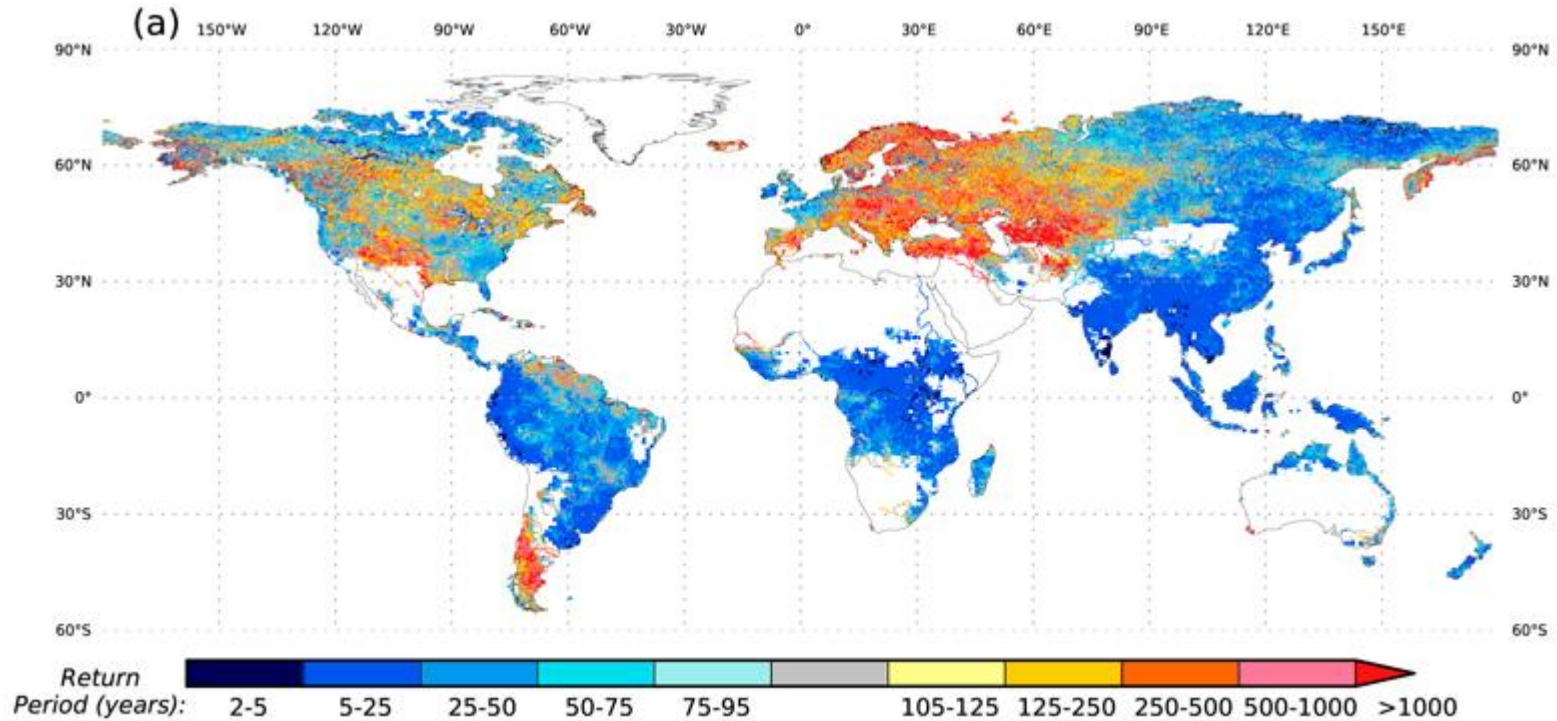
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Project overview

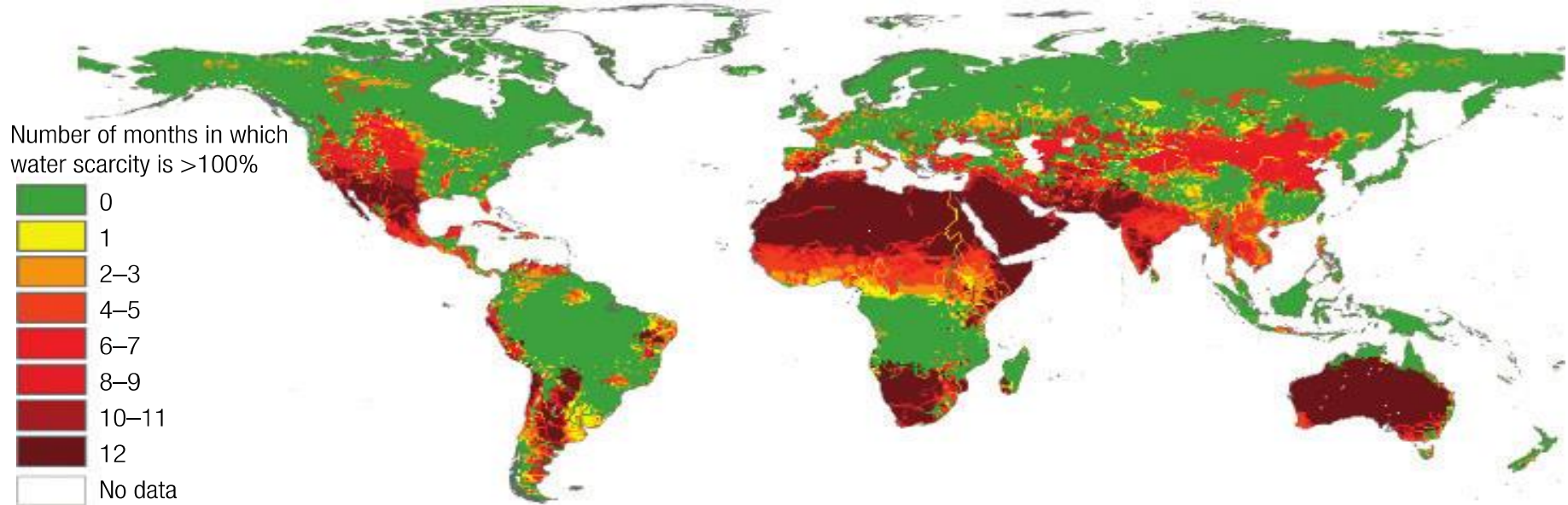


Global Context of Floods and Droughts: Future Flood Risk



Source: Hirabayashi Laboratory, The University of Tokyo / Projected change in flood frequency

Global Context of Floods and Droughts: Water Scarcity



Source: Mekonnen and Hoekstra 2016.

The number of months per year in which blue water scarcity exceeds 1.0 (period 1996-2005)

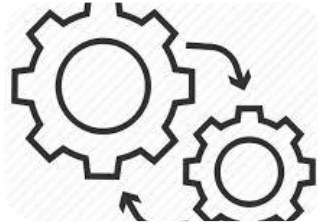
About the Flood and Drought Management Tools project - Why?

Increasing frequency, unpredictability and severity of flood and drought events.
A need for adaptive planning and management of water resources at basin and local level



Project objective

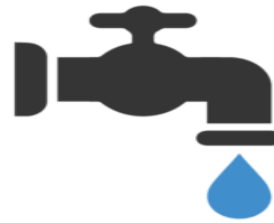
To improve the ability of land, water and urban area managers across scales to address floods and droughts in their planning processes by developing technical software tools which can be applied to address these challenges



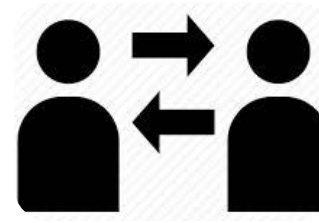
Development of a methodology



Validation and testing in pilot basins

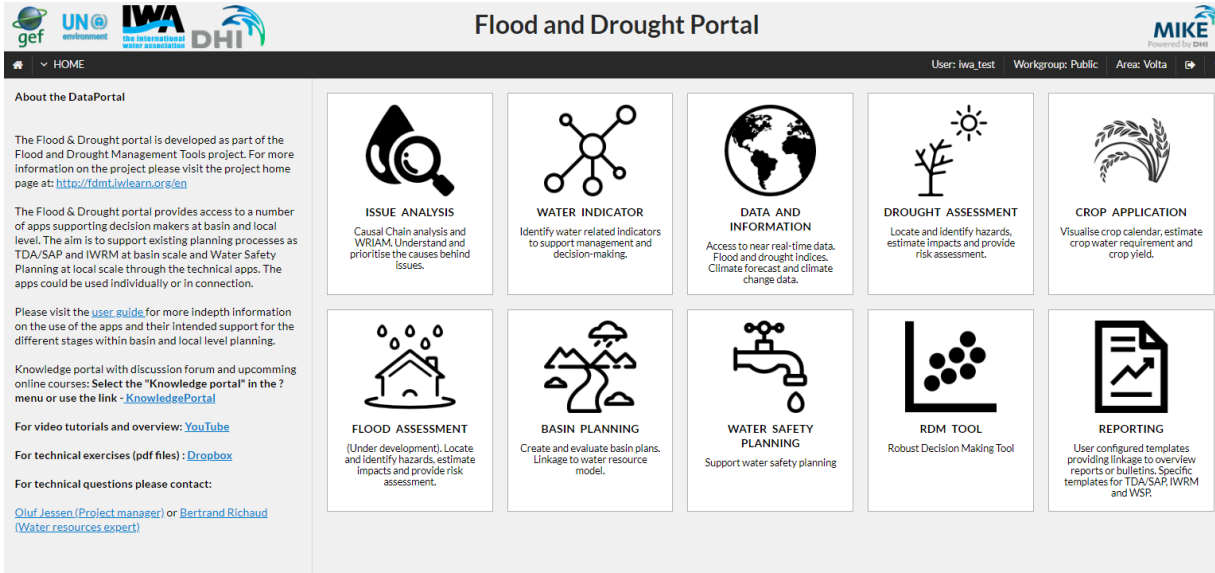


Validation and testing at local level



Capacity building and communication

About the Flood and Drought Management Tools project - How?



The screenshot shows the 'Flood and Drought Portal' website. At the top, there are logos for gef, UN environment, IWA, and DHI. The main header reads 'Flood and Drought Portal' and 'MIKE Powered by DHI'. Below the header, there is a navigation bar with 'HOME', 'User: Iwa_test', 'Workgroup: Public', and 'Area: Volta'. The main content area is divided into two columns. The left column contains text about the portal, including a link to the project home page, a description of the apps, a user guide link, and contact information for project managers. The right column features a grid of ten tool icons with their respective titles and brief descriptions: ISSUE ANALYSIS, WATER INDICATOR, DATA AND INFORMATION, DROUGHT ASSESSMENT, CROP APPLICATION, FLOOD ASSESSMENT, BASIN PLANNING, WATER SAFETY PLANNING, RDM TOOL, and REPORTING.

www.floordroughtmonitor.com

- Developed **web-based tools to support planning and decisions to address flood and drought risks across from transboundary basin level to water utilities**
- **Freely available to all users**

Support for basin and water utility planning

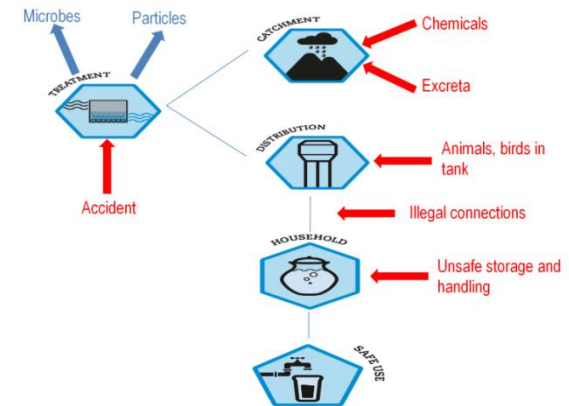


Transboundary Diagnostic Analysis / Strategic Action

Programmes – Tools developed by the Global Environment Facility to assess the state of transboundary basins, and prioritise actions to address key threats.

Integrated Water Resources Management – A process of planning that integrates the management of water, land and other related resources for improved sustainability.

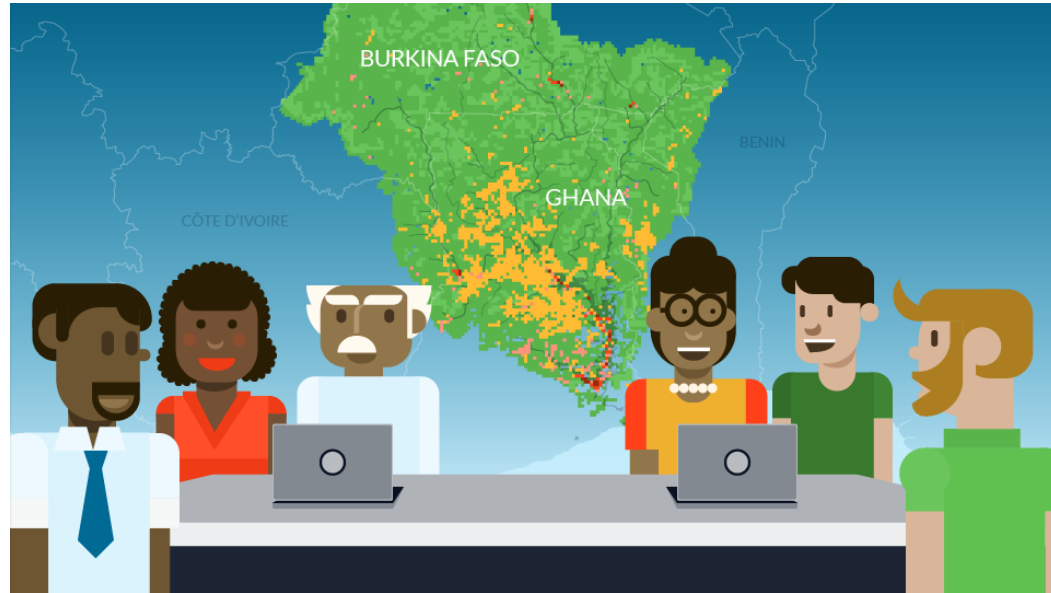
Water Safety Plans – A comprehensive risk assessment that address health related risks and provide an analysis of all steps in the water supply from catchment to consumer.



Urban Water Safety Planning – WHO, Regional Office for South-East Asia 2015

About the Flood and Drought Management Tools project – Who?

Implemented by UN Environment; Executed by DHI and IWA over 4 years. End users are water resource agencies/basin organisations and water utilities.



About the Flood and Drought Management Tools project – Where?

Global applicability, portal and its applications have been developed and tested with stakeholders across 3 pilot basins



*Danube and Nile Basin
as learning basins*

About the Flood and Drought Management Tools project – Chao Phraya



Basin organisation



HAI Hydro and Agro Informatics
Institute, Thailand

Local level (utilities)



PWA Provincial Waterworks Authority,
Thailand



MWA Metropolitan Waterworks,
Bangkok,
Thailand

Additional stakeholders: Royal Irrigation Department, Electricity Generating Authority, Office of Natural Resources and Environmental Policy and Planning, Thailand Meteorological Department

About the Flood and Drought Management Tools project – Lake Victoria Basin



Lake Victoria

Basin organisation



LVBC Lake Victoria Basin
Commission

Local level (utilities)



NWSC National Water & Sewerage
Corporation, Jinja, Uganda



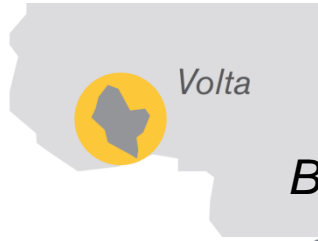
KIWASCO Kisumu Water & Sewerage
Company Limited, Kenya



MWAUWASA Mwanza Urban Water &
Sewerage Authority, Tanzania

Additional stakeholders: Water resource representatives from 5 countries in Lake Victoria Basin

About the Flood and Drought Management Tools project – Volta Basin



Basin organisation



VBA Volta Basin Authority

Local level (utilities)



ONEA Office National de l'Eau et de l'Assainissement, Burkina Faso

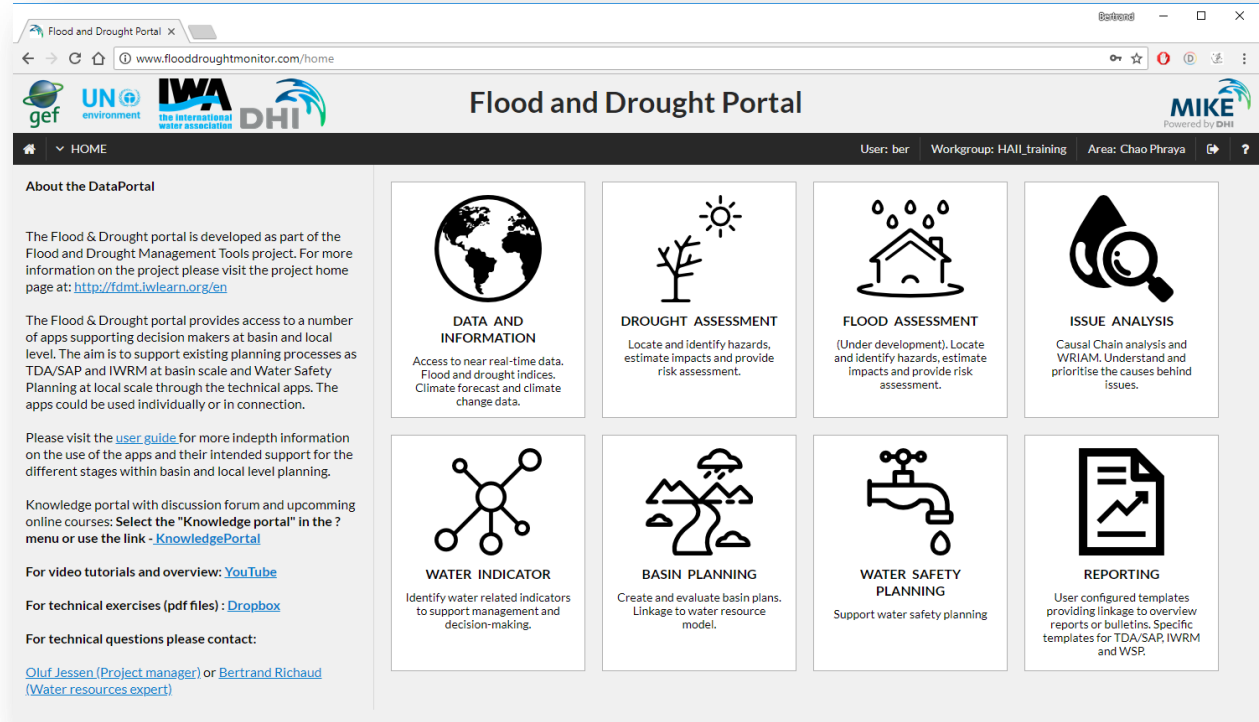


GWCP Ghana Water Company Limited, Ghana

Additional stakeholders: Water Resources Commission (WRC), Hydrological Services Department (HSD), Agence de l'Eau (Burkina Faso), Volta River Authority (VRA)

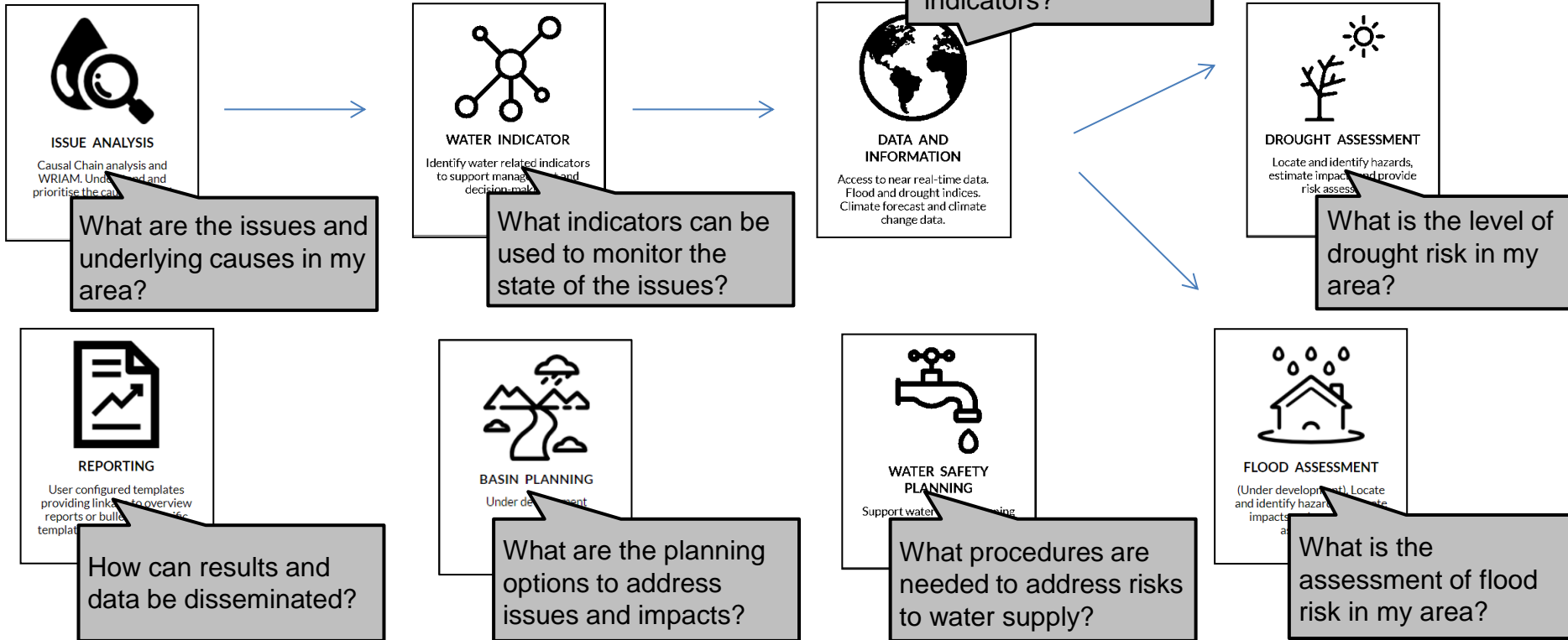
Key achievements - Flood and Drought portal

- Suites of applications to support planning
- Flexible methodology applicable for over 200 transboundary basins
- Accessible to all stakeholders



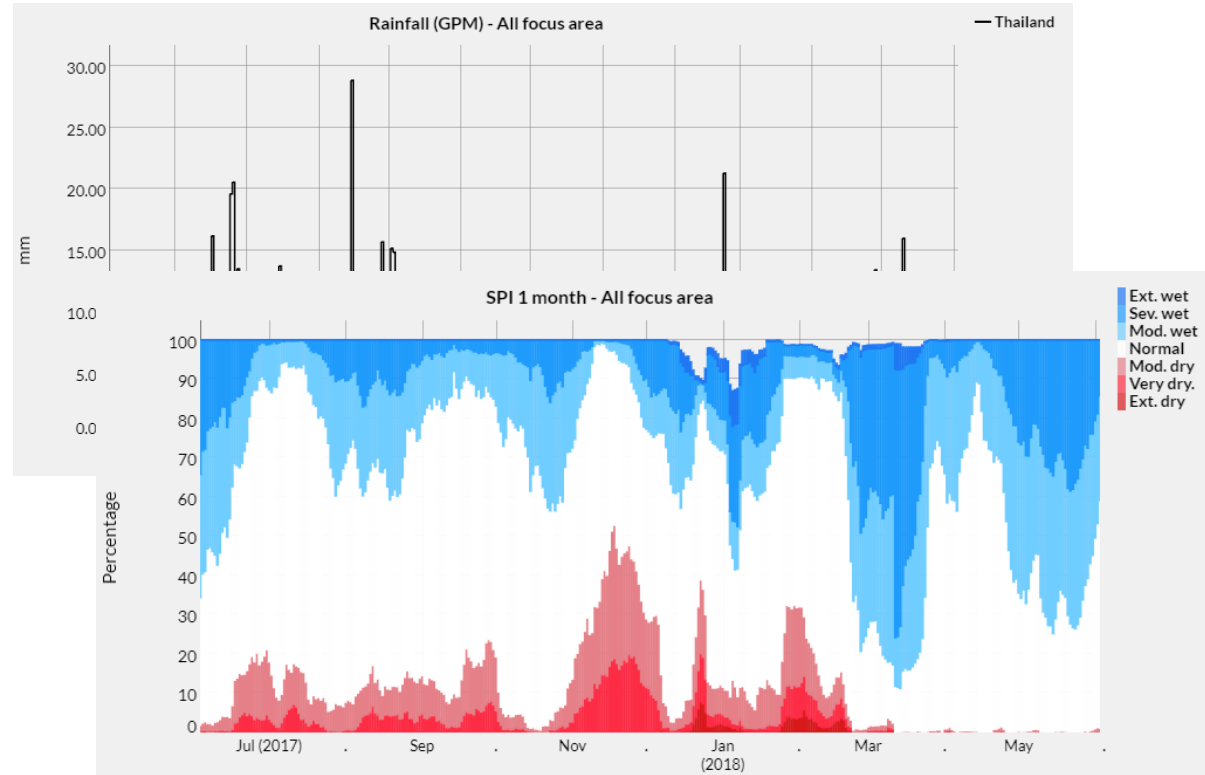
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Technical Applications




Access to near real-time data and forecast

- Real time **satellite based** data (climate, soil moisture, vegetation)
- Seasonal rainfall **forecast**
- Computation of flood and drought related **indices**
- Precipitation, PET and temperature **delta change** factors




Automated reporting

- Includes maps, tables, time series...
- Scheduled regular intervals to include **latest information**
- Sent by **email** to selected recipients
- Does not require access to the portal to view it
- Can be done in **any language**



2 Climate status

Flood and



Rainfall
Monitoring the n year is vital to d long-term histor

Historical rainfall
The historical ra The data might i

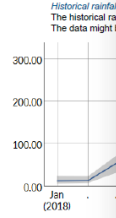


Figure 1 Historical rainfall : The historical ra The table gives:

Table 2 Monthly rainfall av

Time	Jan.	Feb.	March	Z
2020				
2021	28.5	8.7	133.0	7
2022	8.6	5.2	42.4	8
2023	8.6	27.7	102.9	6
2024	10.8	11.5	20.6	7
2025	3.0	4.6	29.4	6
2026	6.9	27.6	77.1	1
2027	15.6	14.4	47.6	9
2028	7.8	12.7	36.7	1
2029	5.2	20.6	128.8	1
2010	18.6	13.6	20.1	6
2011	26.4	30.7	121.1	1
2012	54.6	23.7	14.6	1
2013	17.2	24.4	28.6	1
2014	2.1	0.6	35.2	1

³ Rainfall observation is base precipitation with a spatial re: 2000 to present. Source: [http](#)

Operational Drought Report / 2019-06-03

NDVI deviation relative

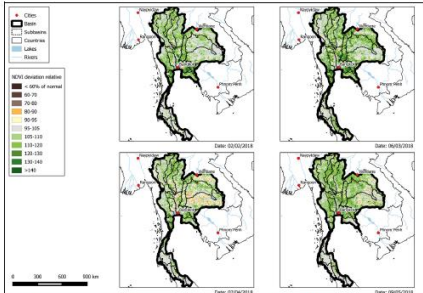


Figure 6 Maps of the NDVI deviation from the long term mean during the last four months

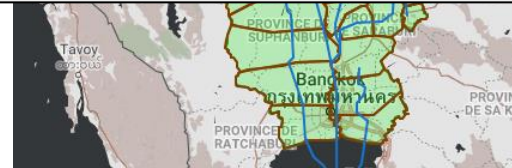
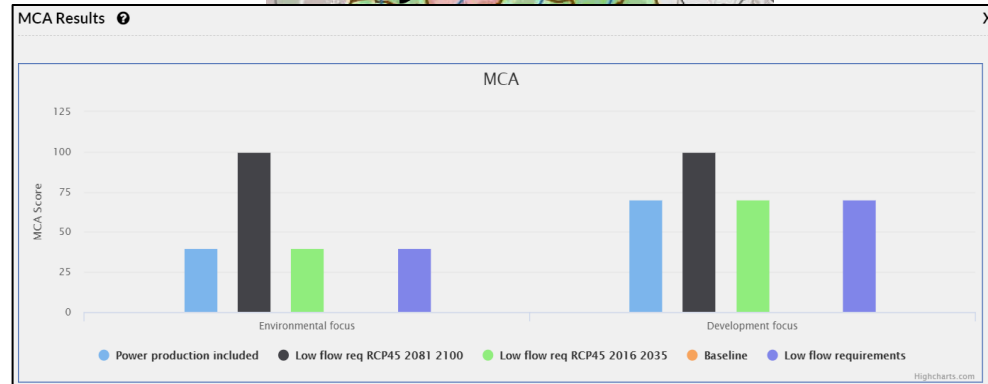
Temperature and Vegetation based drought index:
The vegetation greenness index (VCI) can be combined with temperature drought index (TCI) to form the Vegetation health index (VHI).

Operational Drought Report / 2019-06-03

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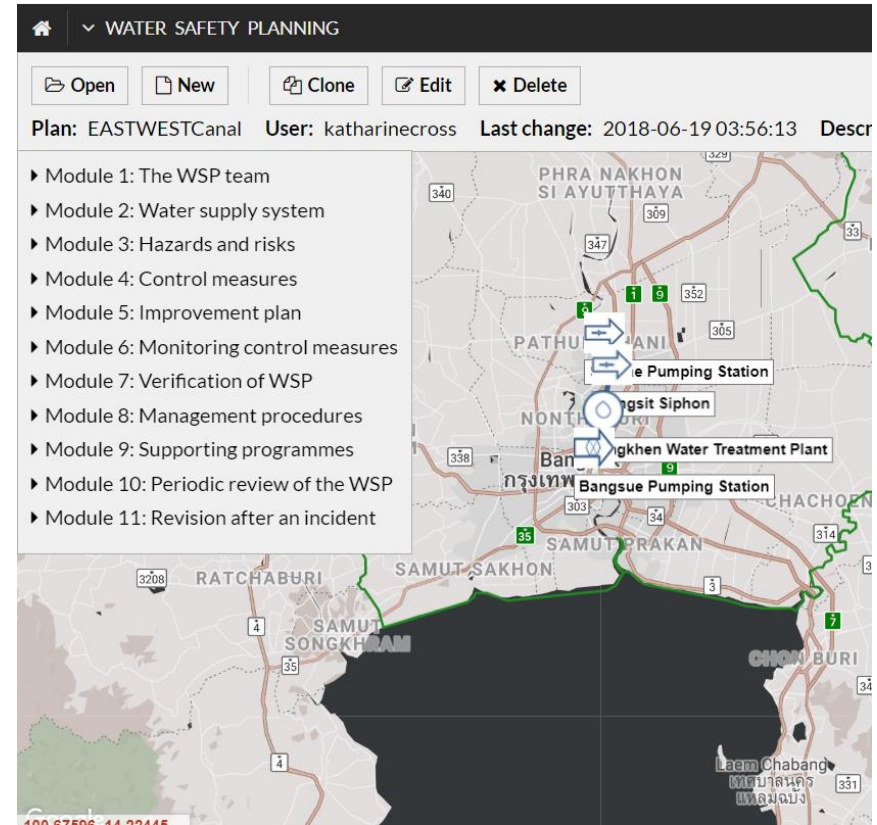
Basin-wide water resources planning tool

- Water allocation model to compute indicators related to planning
- Impact of existing and new **infrastructures**
- Impact of **external factors** (climate change, population growth)
- Multi-criteria analysis (MCA)
- Crop calendar and crop yield estimate



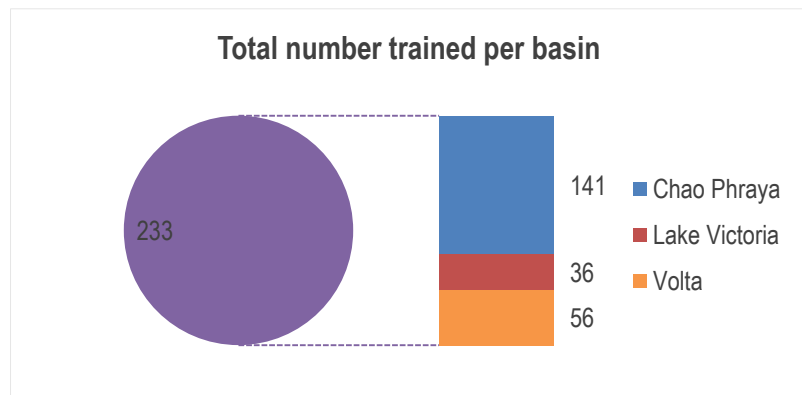
Tools to support water safety planning in water utilities

- Application supports the 11 modules in the WSP manual each representing a key step in development and implementation of WSP
- Documents WSP and provides platform for sharing and reporting within a utility
- Prompts utilities to consider climate change impacts on their supply system



Additional achievements

- Portal development
 - Consultations with > 50 stakeholders during inception
 - Iterative approach to development incorporating feedback in applications
- Capacity building and engagement activities
 - Over 200 people trained over 4 years;
 - 26 workshops
 - Engagement at regional and international level
- Training material and outreach
 - Easy to use step-by-step guides
 - How-to video series
 - Knowledge Portal
- Integrating applications in new projects



Communication, dissemination and engagement

- Website: <http://fdmt.iwlearn.org/>
- Information sheets (English, French, Thai)
- Newsletters (+13)
- Blogs, articles and press releases (+45)
- Experience notes (2)
- Videos (+14)
- Infographics (4)
- Posters (10)
- Webinars (5, and 3 upcoming)
- Events (+19)



Key lessons learned

- Availability and accessibility
 - Many regions have limited water resource information
 - Access to near real time data and forecasting can fill gaps
- Usability
 - Online portal with guidance
 - Can use individually or integration of applications into a single workflow
 - For water utilities – using WSP as an entry point
- Communication
 - Language
 - Continued outreach e.g. Follow up to technical trainings
- Sustainability
 - Integration into future projects
 - Uptake by other organisations

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For more information, contact

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Or learn more at

fdmt.iwlearn.org

