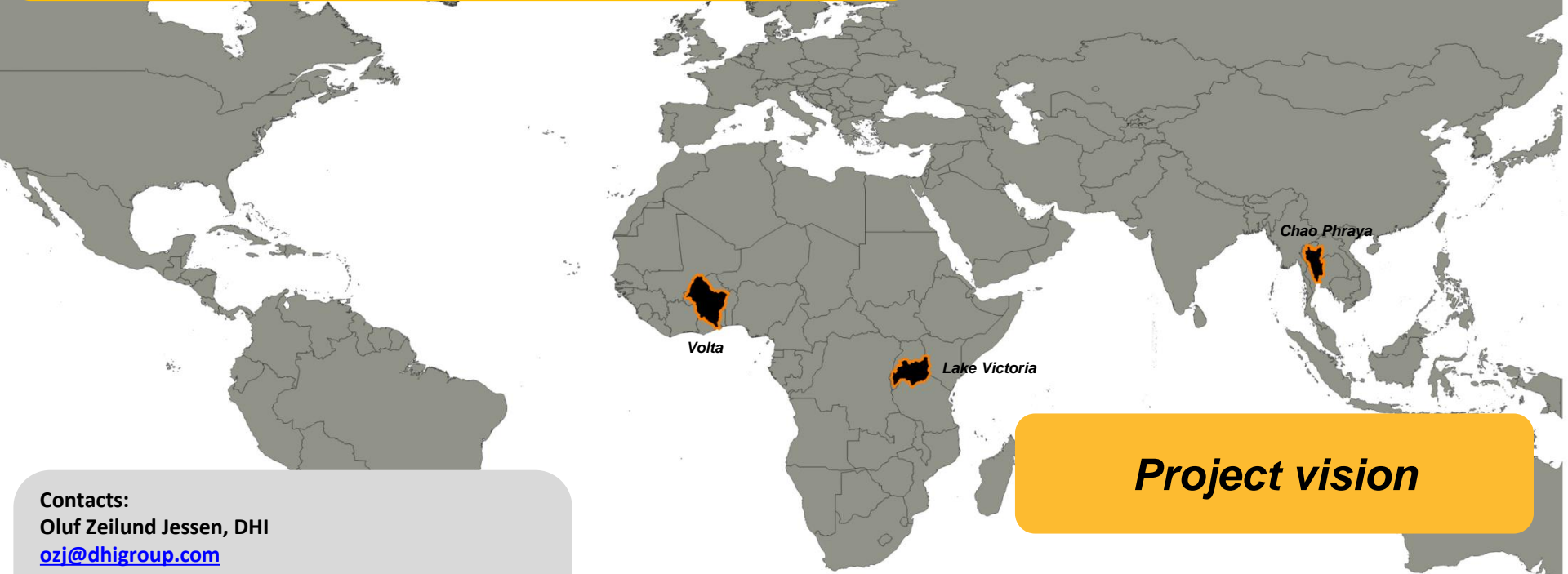


FLOOD & DROUGHT MANAGEMENT TOOLS



Contacts:
Oluf Zeilund Jessen, DHI
ozj@dhigroup.com

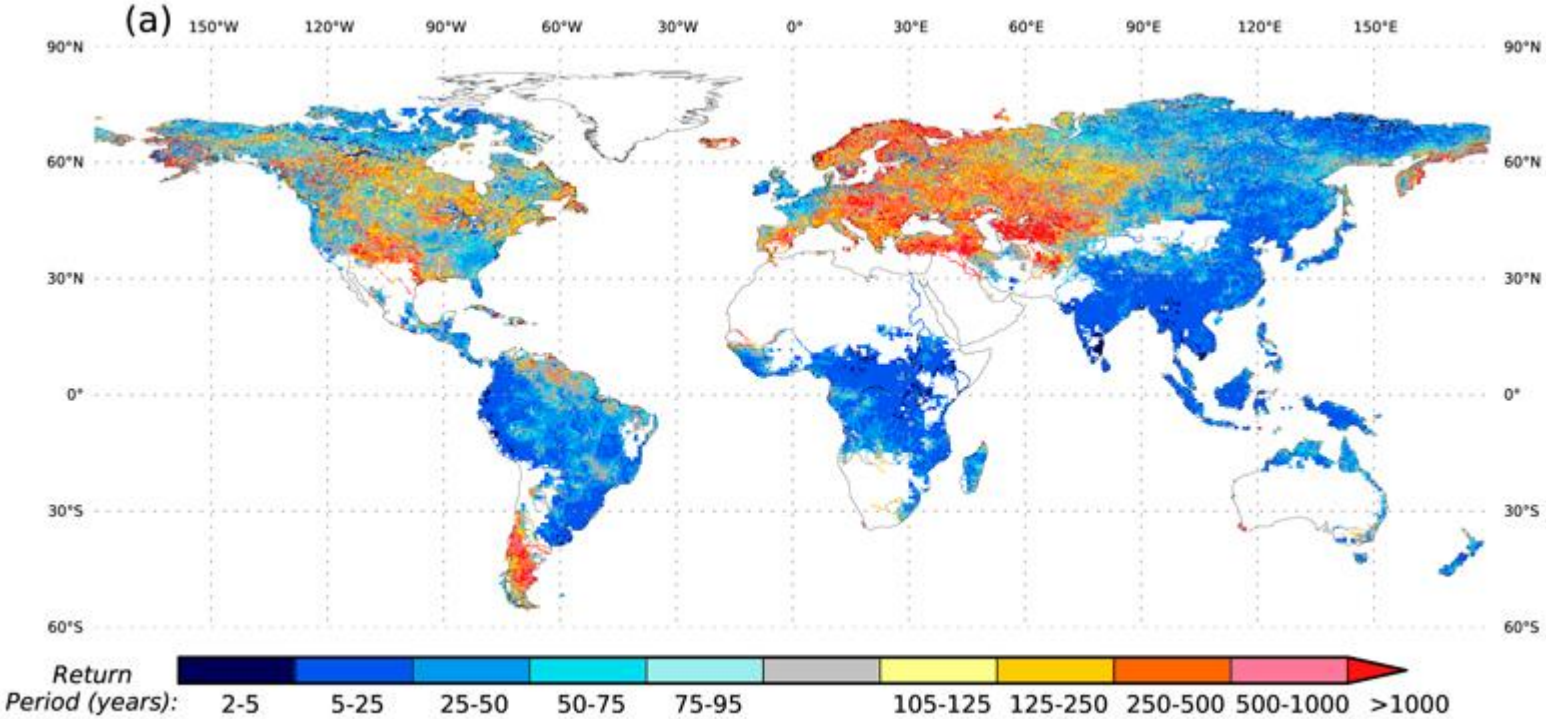
Katharine Cross, International Water Association
(IWA)
Katharine.cross@iwahq.org

Project vision



Global Context of Floods and Droughts

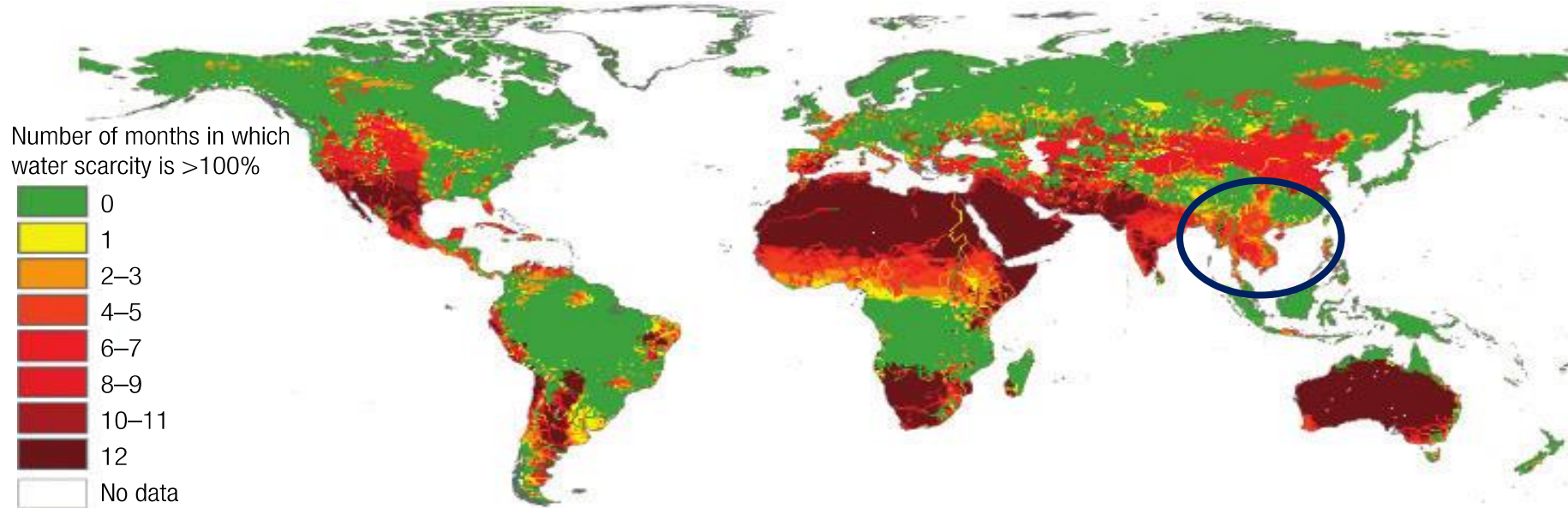
Future Flood Risk



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

Global Context of Floods and Droughts

Water Scarcity

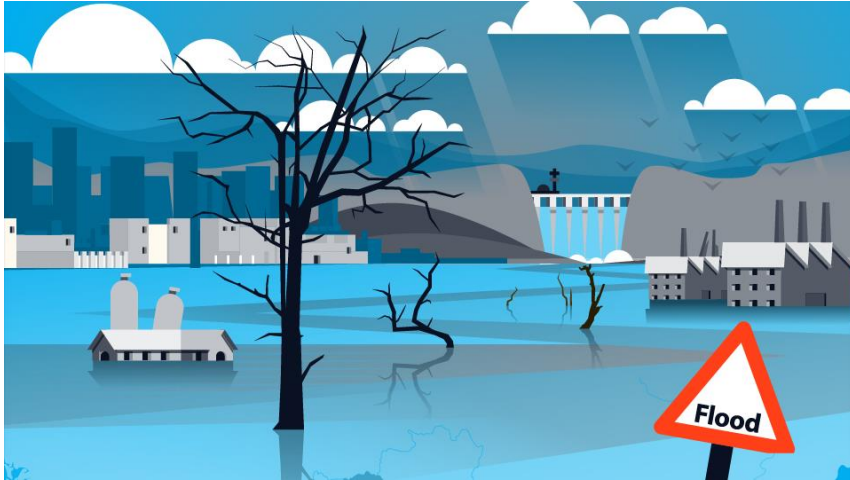


Source: Mekonnen and Hoekstra 2016.

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

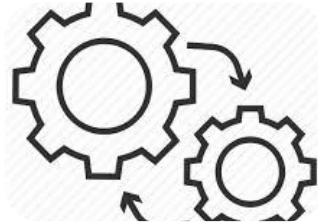
About the Flood and Drought Management Tools Project - Why?

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



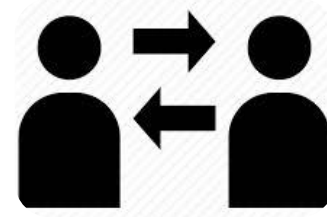
Development of a methodology



Validation and testing in pilot basins



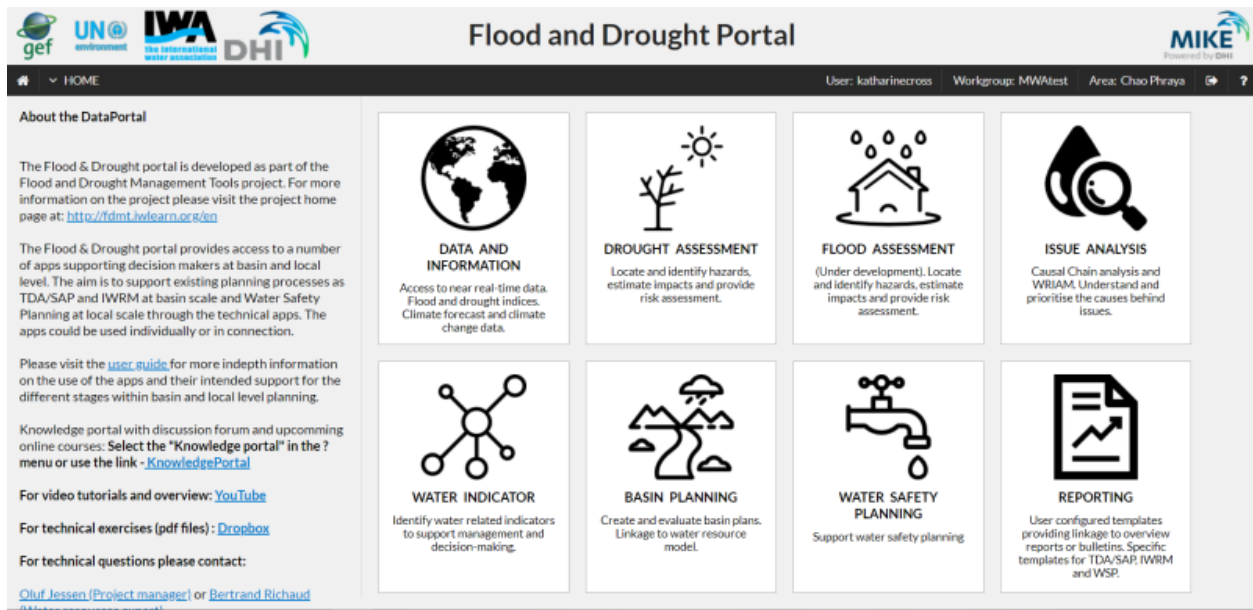
Validation and testing at local level



Capacity building and communication

About the Flood and Drought Management Tools Project - How?

Developing web-based tools to support planning and decisions to address flood and drought risks across scales



The screenshot shows the 'Flood and Drought Portal' website. The header includes logos for gef, UN environment, IWA, and DHI, and the title 'Flood and Drought Portal'. The user interface shows a navigation menu with 'HOME', a user profile 'User: katharineros', a workgroup 'Workgroup: MWAtest', and an area 'Area: Chao Phraya'. The main content area is titled 'About the DataPortal' and contains several sections of text and a grid of eight tool icons with descriptions:

- DATA AND INFORMATION**: Access to near real-time data. Flood and drought indices. Climate forecast and climate change data.
- DROUGHT ASSESSMENT**: 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 WRIAM. Understand and prioritise the causes behind issues.
- WATER INDICATOR**: Identify water related indicators to support management and decision-making.
- Basin Planning**: Create and evaluate basin plans. Linkage to water resource model.
- WATER SAFETY PLANNING**: Support water safety planning.
- REPORTING**: User configured templates providing linkage to overview reports or bulletins. Specific templates for TDA/SAP, IWRM and WSP.

Additional text in the 'About the DataPortal' section includes: 'The Flood & Drought portal is developed as part of the Flood and Drought Management Tools project. For more information on the project please visit the project home page at: <http://fdmt.iwlearn.org/en>', 'The Flood & Drought portal provides access to a number of apps supporting decision makers at basin and local level. The aim is to support existing planning processes as TDA/SAP and IWRM at basin scale and Water Safety Planning at local scale through the technical apps. The apps could be used individually or in connection.', 'Please visit the [user guide](#) for more indepth information on the use of the apps and their intended support for the different stages within basin and local level planning.', 'Knowledge portal with discussion forum and upcoming online courses: Select the "Knowledge portal" in the ? menu or use the link - [KnowledgePortal](#)', 'For video tutorials and overview: [YouTube](#)', 'For technical exercises (pdf files) - [Dropbox](#)', and 'For technical questions please contact: [Oluf Jessen \(Project manager\)](#) or [Bertrand Richaud](#)'.

www.flooddroughtmonitor.com

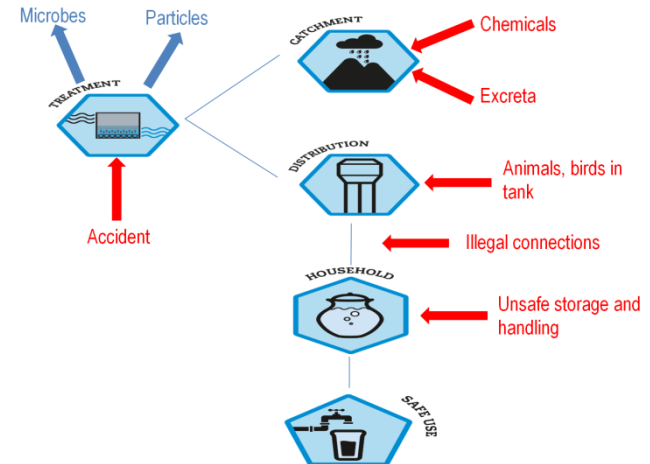
Support for basin and water utility planning



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.



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.



www.flooddroughtmonitor.com

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*

Chao Phraya

Flood and Drought Management Tools project *Thailand*

- Stakeholder consultations in tool design and functionality
- 3+ Technical trainings at basin and water utility levels
- Flood and Drought Symposium 2015
- **Flood and Drought Final Event – June 6th, 2018**



Hydro and Agro Informatics
Institute (HAI)



Provincial Waterworks Authority
(PWA)



Metropolitan Waterworks Authority
(MWA)

FLOOD & DROUGHT MANAGEMENT TOOLS



Project overview

Contacts:
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ozj@dhigroup.com

Katharine Cross, International Water Association
(IWA)
Katharine.cross@iwahq.org



Flood and Drought portal overview

- Suites of applications to support planning
- Accessible to all stakeholders in Thailand
- Tailored to Chao Phraya basin and Thailand area

Flood and Drought Portal

User: ber | Workgroup: HAI1_training | Area: Chao Phraya

About the DataPortal

The Flood & Drought portal is developed as part of the Flood and Drought Management Tools project. For more information on the project please visit the project home page at: <http://fdmt.iwlearn.org/en>

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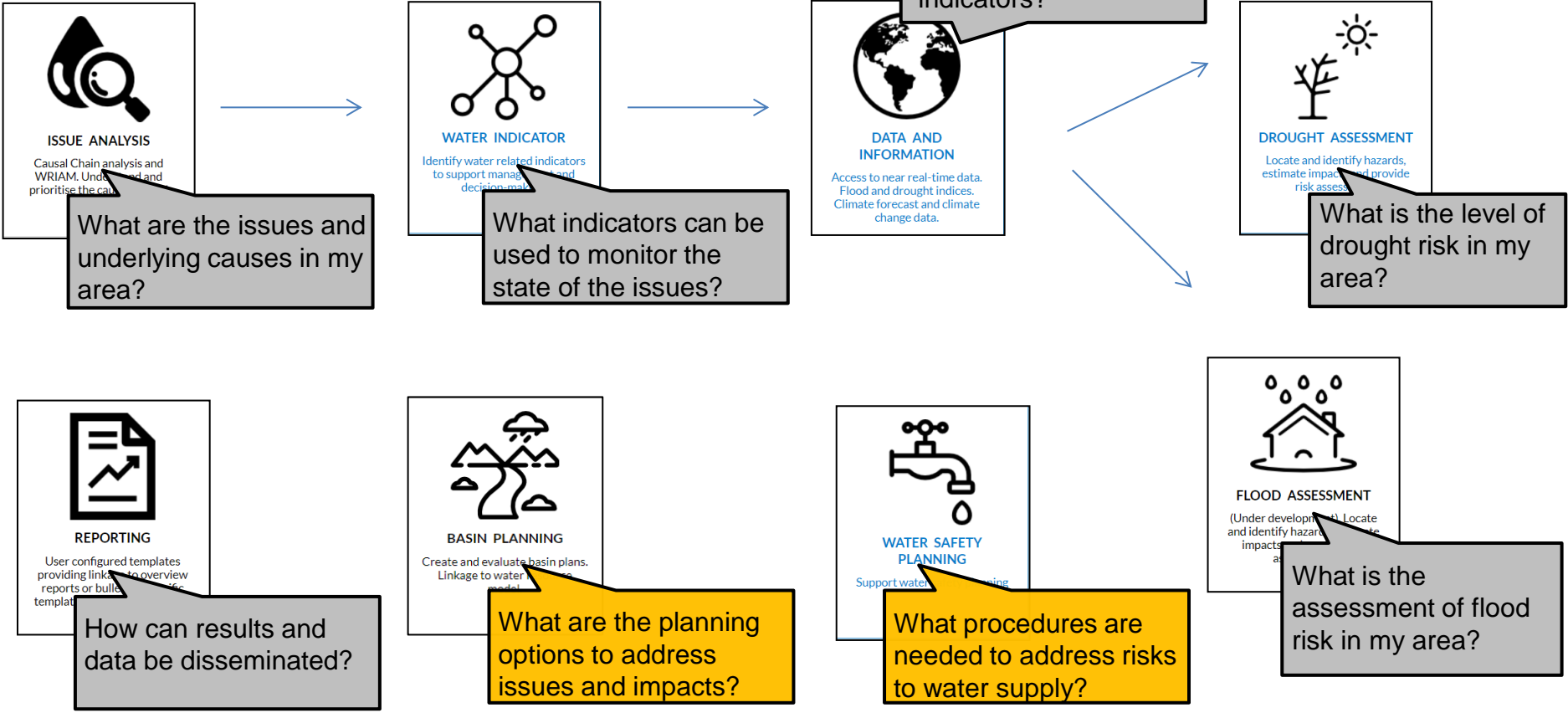
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<p>DATA AND INFORMATION</p> <p>Access to near real-time data. Flood and drought indices. Climate forecast and climate change data.</p>	<p>DROUGHT ASSESSMENT</p> <p>Locate and identify hazards, estimate impacts and provide risk assessment.</p>	<p>FLOOD ASSESSMENT</p> <p>(Under development). Locate and identify hazards, estimate impacts and provide risk assessment.</p>	<p>ISSUE ANALYSIS</p> <p>Causal Chain analysis and WRIAM. Understand and prioritise the causes behind issues.</p>
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Technical Applications



Key benefits to Thailand...



**Access to near
real-time data and
forecast**



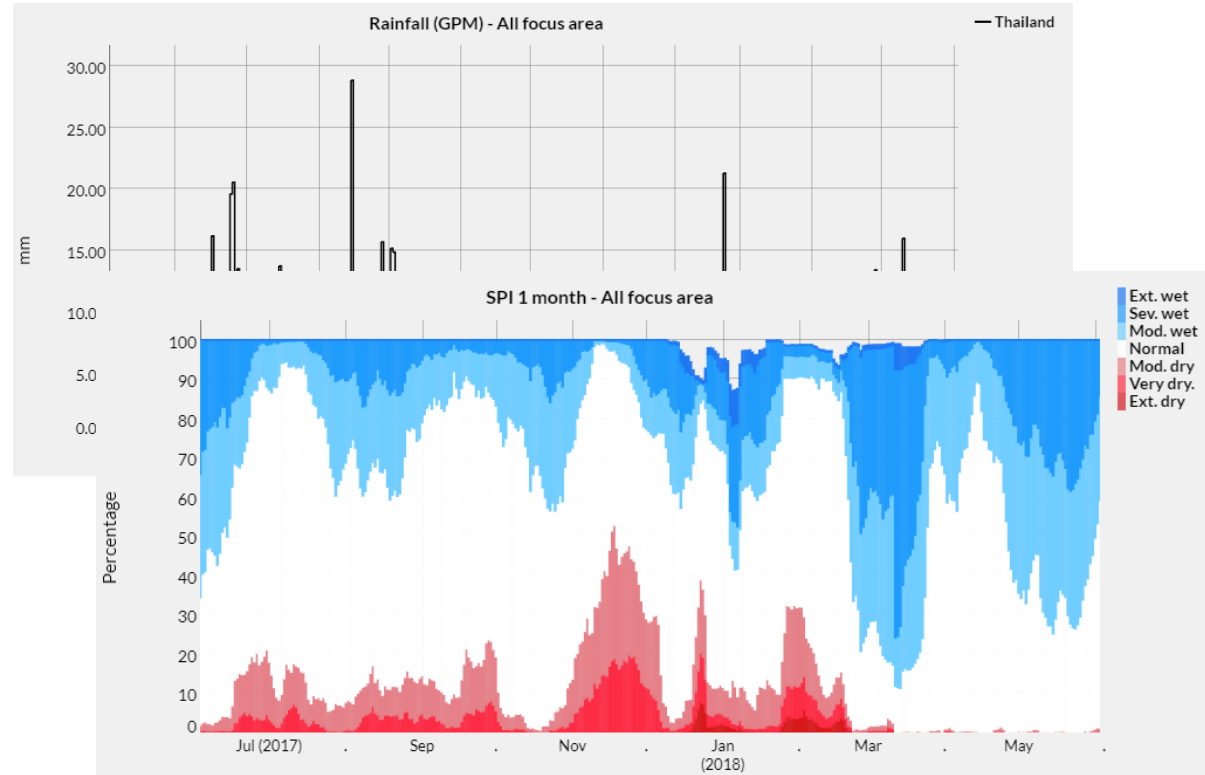
**Automated
reporting**



**Basin-wide
water resources
application**


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 **Thai**



2 Climate status

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

Historical rainfall
The historical ra
The data might i

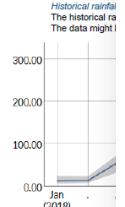


Figure 1 Historical rainfall :
The historical ra
The table gives:

Table 2 Monthly rainfall av

Time	Jan.	Feb.	March	4
2020			55.1	1
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	56.7	1
2029	5.2	20.6	128.8	1
2010	18.9	13.9	20.1	6
2011	26.4	30.7	121.1	1
2012	54.9	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 / 2019-05-03

NDVI deviation relative

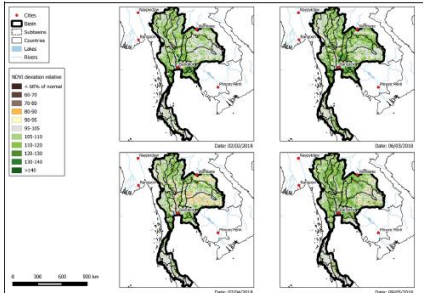


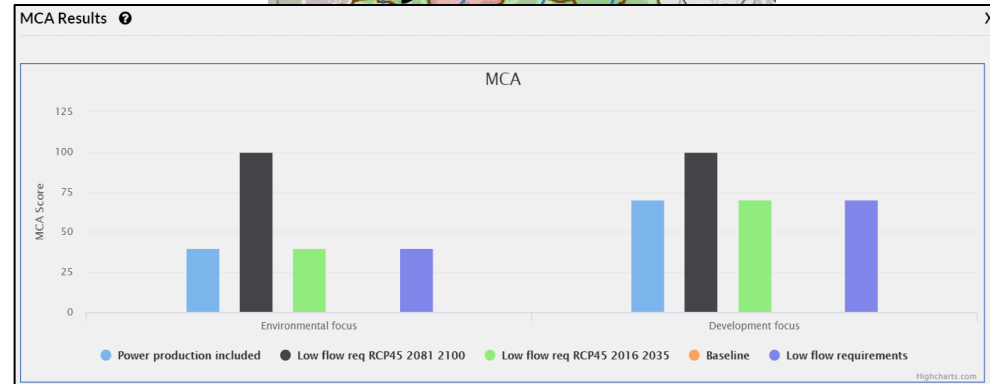
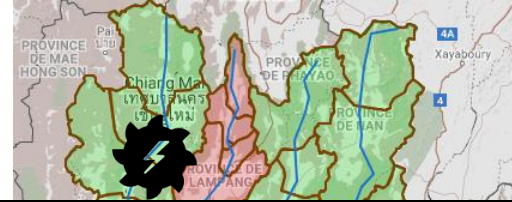
Figure 6 Maps of the NDVI deviation from the long term mean during the last four months

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 / 2019-05-03

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



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