

FLOOD & DROUGHT MANAGEMENT TOOLS



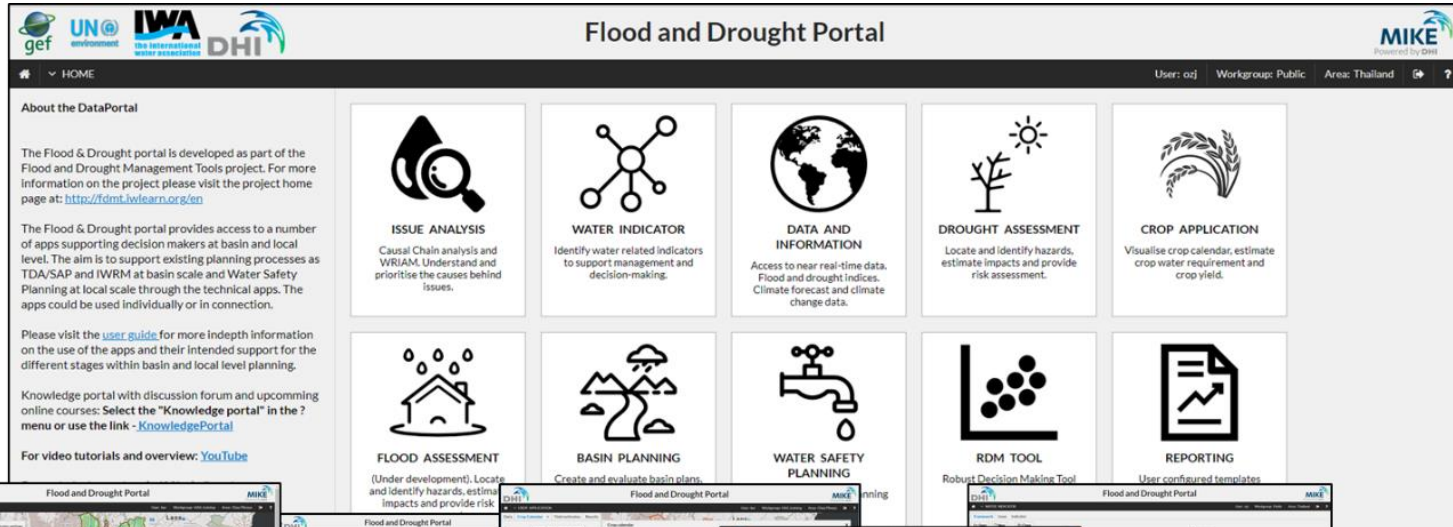
Contacts:
Oluf Zeilund Jessen, DHI
ozj@dhigroup.com

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

*Perspective, experience
and next steps*



Water Management – Floods & Drought project



Flood and Drought Portal

User: oaj | Workgroup: Public | Area: Thailand

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.lwlearn.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](#)

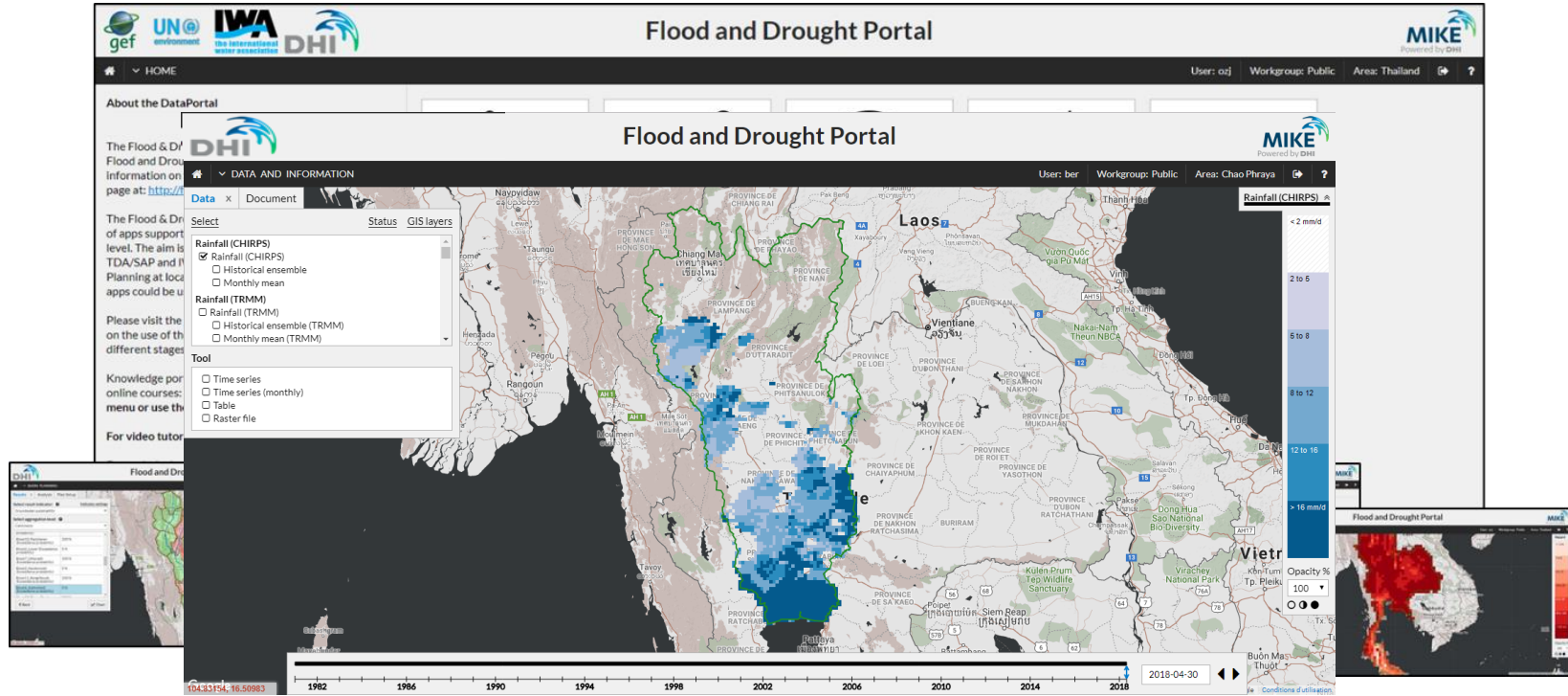
For video tutorials and overview: [YouTube](#)

- 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.
- 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.
- CROP APPLICATION**: Visualise crop calendar, estimate crop water requirement and crop yield.
- FLOOD ASSESSMENT**: (Under development). Locate and identify hazards, estimate impacts and provide risk
- Basin Planning**: Create and evaluate basin plans.
- Water Safety Planning**: Robust Decision Making Tool.
- RDM TOOL**: Robust Decision Making Tool.
- REPORTING**: User configured templates.



www.flooddroughtmonitor.com

Water Management – Floods & Drought project

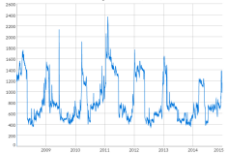


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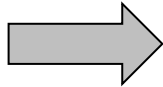
Data availability

Data availability is a key issue in water resources management

- Data availability is a key concern in many countries and basins
- Availability of a “basic” set of data for water resources management is critical



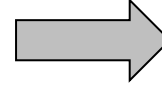
Data



Analysis



Decision process

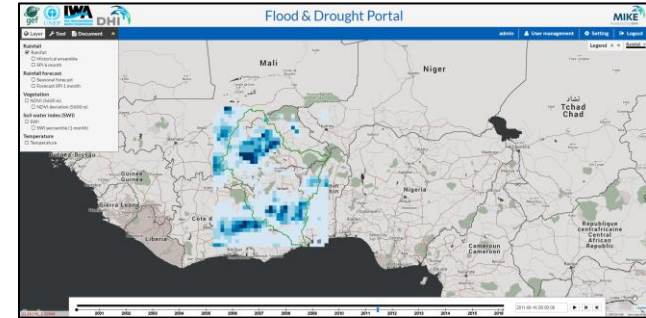
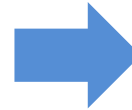
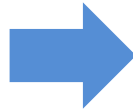


Improved decision
making

Data availability



Daily update
Download
QA



Daily update

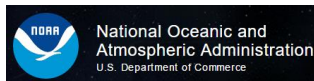
Number cruncher

WEB server

Download on global scale
Reproject and convert to netcdf
QA of data quality

Subset to basin scale
Calculate indices
Calculate weighted time series
QA and monitor process
Push to web-server





Data available as GIS layers and time series
User configuration and control



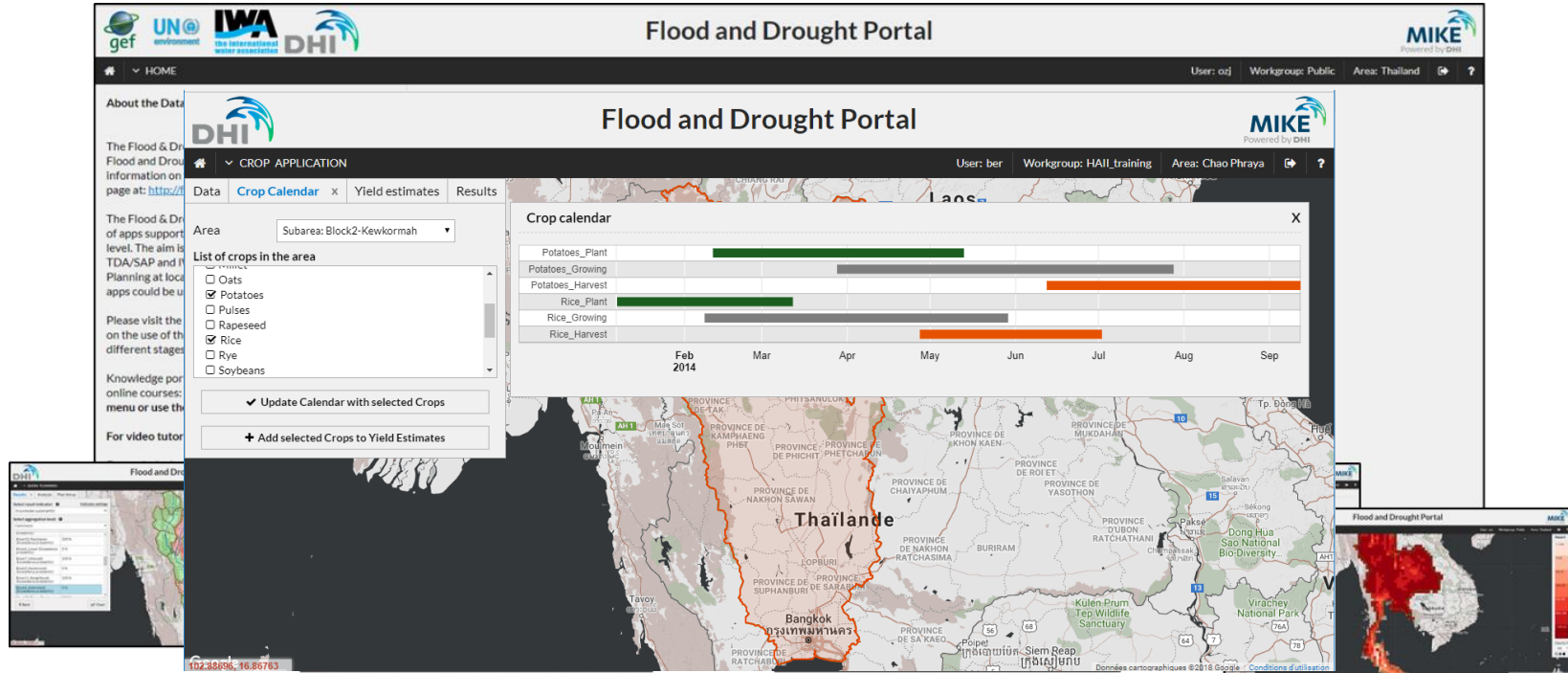
Data availability



Types of data

Climate	Vegetation	Soil moisture	Socio economic	Indicators
<p>Key input for environmental assessment</p> <ul style="list-style-type: none">• Historic• Near real time• Forecast• Projection 	<p>Impact on agricultural sector</p> <p>Crop distribution and crop growth</p> <ul style="list-style-type: none">• Historic• Near real time 	<p>Water availability</p> <p>Drought assessment Flood risk</p> <ul style="list-style-type: none">• Historic• Near real time 	<p>Socio economic impact</p> <p>Static data</p> <ul style="list-style-type: none">• Historic• Future 	<p>State of any environmental issue</p> <p>Statistical measure providing a clear indication of a state</p>

Water Management – Floods & Drought project



Flood and Drought Portal

User: oaj Workgroup: Public Area: Thailand

Flood and Drought Portal

User: ber Workgroup: HAIT_training Area: Chao Phraya

Crop Application

Area: Subarea: Block2-Kewkormah

List of crops in the area

- Oats
- Potatoes
- Pulses
- Rapeseed
- Rice
- Rye
- Soybeans

Crop calendar

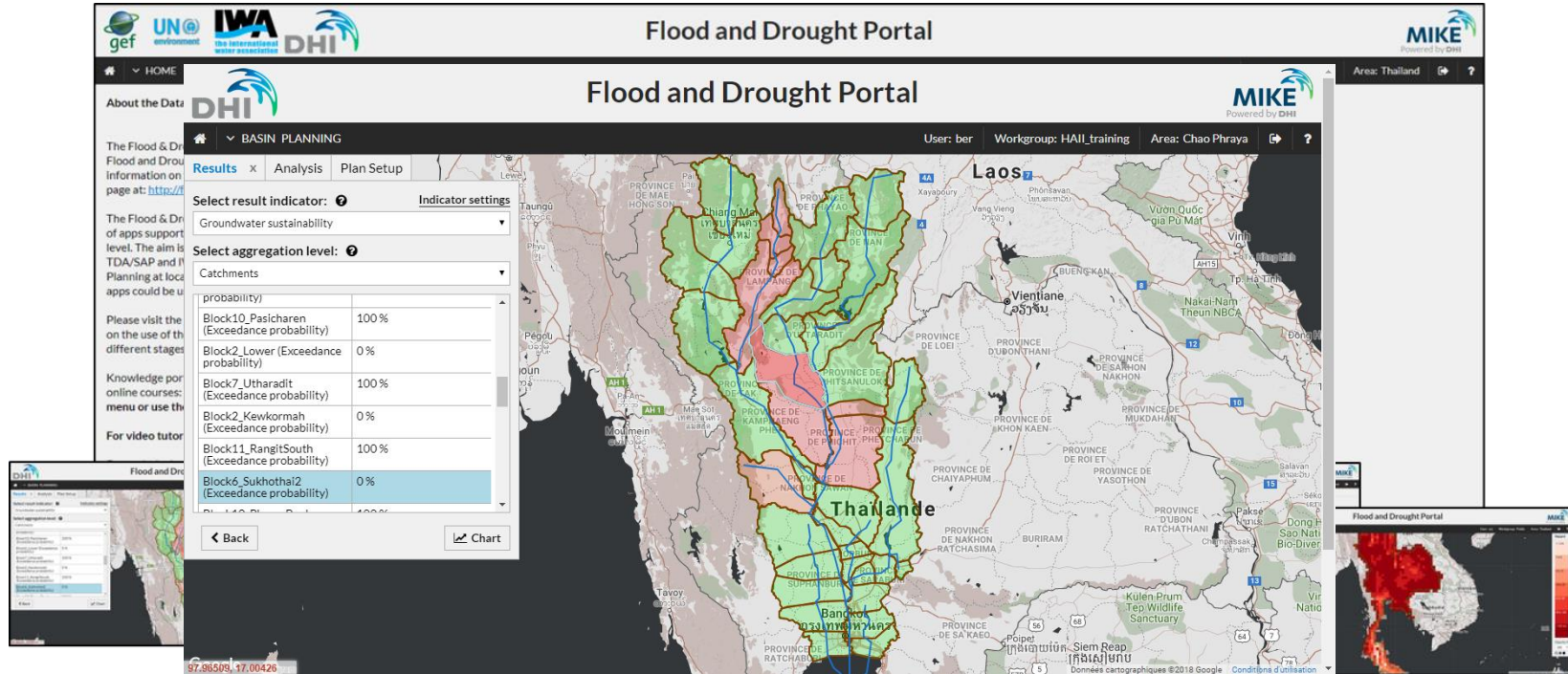
Crop	Feb 2014	Mar	Apr	May	Jun	Jul	Aug	Sep
Potatoes_Plant								
Potatoes_Growing								
Potatoes_Harvest								
Rice_Plant								
Rice_Growing								
Rice_Harvest								

Buttons: Update Calendar with selected Crops, Add selected Crops to Yield Estimates

Map: Thailand, Bangkok, Chao Phraya region

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Water Management – Floods & Drought project



Flood and Drought Portal

MIKE
Powered by DHI

Area: Thailand

User: ber Workgroup: HAIJ_training Area: Chao Phraya

Flood and Drought Portal

Basin Planning

Results Analysis Plan Setup

Select result indicator: **Indicator settings**

Groundwater sustainability

Select aggregation level: **Indicator settings**

Catchments

(probability)	
Block10_Pasicharen (Exceedance probability)	100 %
Block2_Lower (Exceedance probability)	0 %
Block7_Utharadit (Exceedance probability)	100 %
Block2_Kewkormah (Exceedance probability)	0 %
Block11_RangitSouth (Exceedance probability)	100 %
Block6_Sukthohal2 (Exceedance probability)	0 %
Block11_RangitNorth (Exceedance probability)	100 %

Back Chart

97.98509, 17.00426

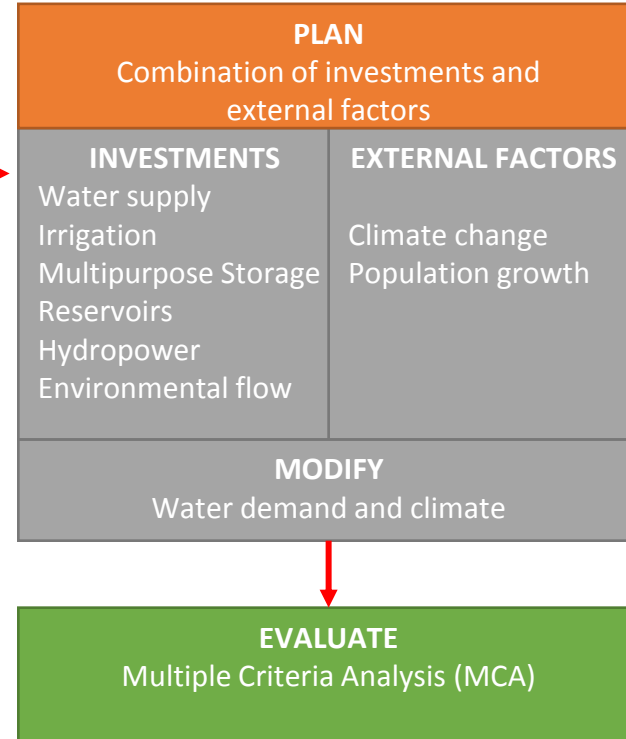
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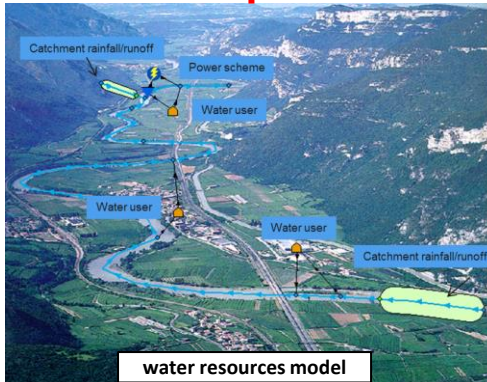
Basin Planning



A baseline plan is established by the tool. New plans created will incur in alterations to the baseline model.



A user uploads the baseline model to the application



Basin planning

Select baseline:

Nakambe

New

Select investment type: ?

Irrigation

Results x

Analysis

Plan Setup

Select result indicator: ?

Indicator settings

Select one or two plans to view

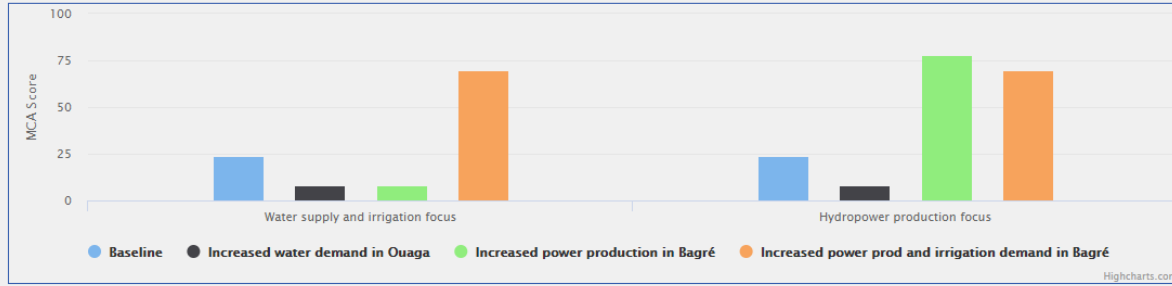
- Baseline
- Increased water demand in Ouaga
- Increased power production in Bagré
- Increased power prod and irrigation demand in Bagré

View in

Investment information:

	Increased power prod and irrigation demand in Bagré
Name	Bagre
Description	
Level Area Volume Table	Open
Initial Water Level (m)	231.49
Bottom Level (m)	215
Dam Crest Level (m)	235
Top of Dead Storage (m)	223.5

MCA Results ?

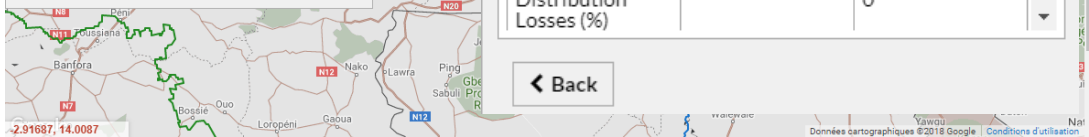


MCA Score Matrix: Plans vs Strategies

Strategy	Baseline	Increased water demand in Ouaga	Increased power production in Bagré	Increased power prod and irrigation demand in Bagré
Water supply and irrigation focus	24	8	8	70
Hydropower production focus	24	8	78	70

Increased power prod and irrigation demand in Bagré	Diff.
0.01 GWh	0.01 GWh

Chart



DISTRIBUTION Losses (%)

Back



Water management across time scales

Hours

Days

Months

Years

Decades

Solutions

- On-line monitoring
- Flash flood forecasting
- Real-time control
- Emergency management
- **Flood forecasting** and early warning
- ...

- **Reservoir operation**
- **Water allocation**
- **Seasonal forecasting**
- **Drought management**
- Reservoir sedimentation management
- ...

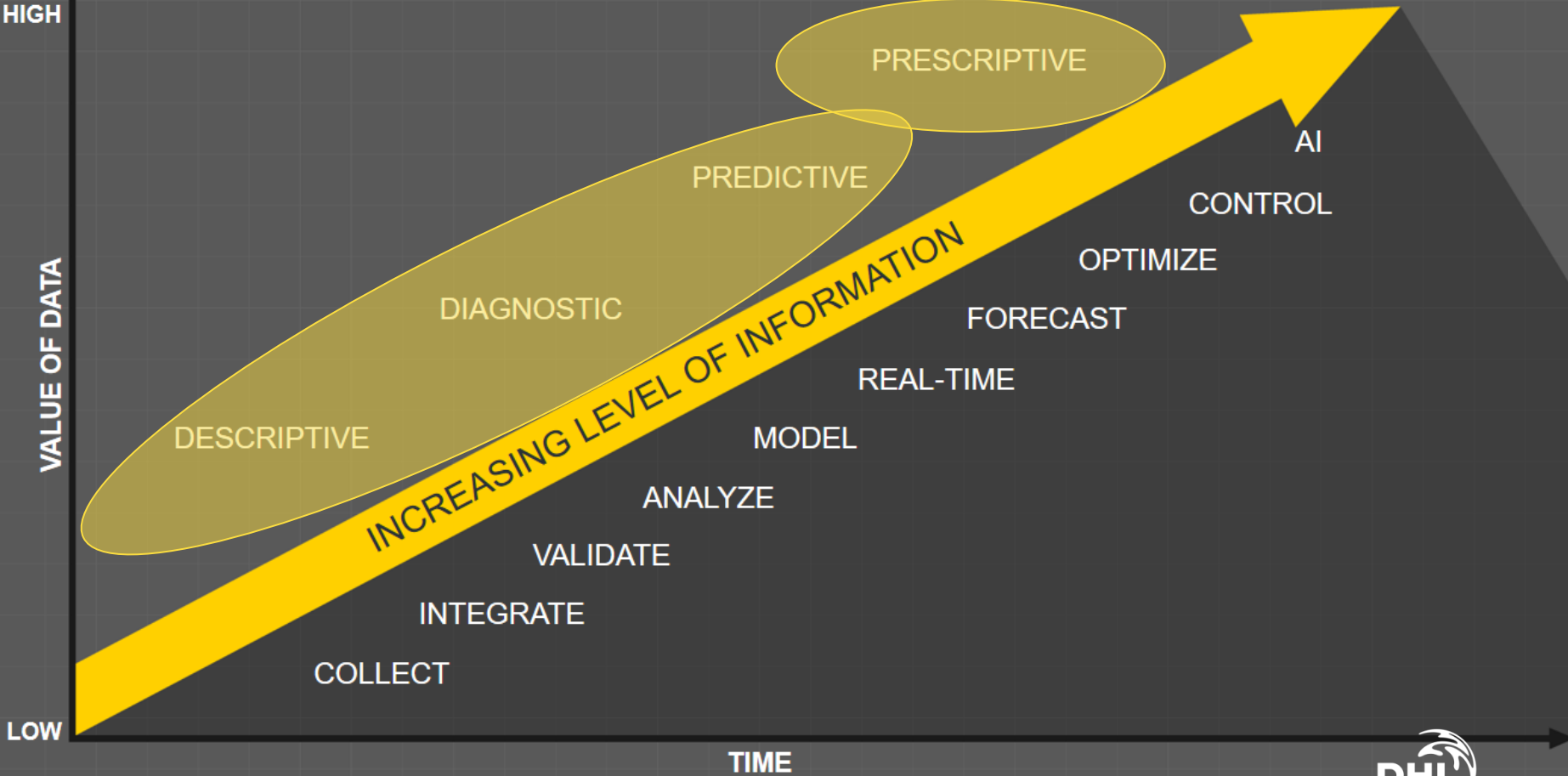
- Infrastructure development
- **Water and environmental planning**
- **Climate change adaptation**
- ...



- **Data availability** is often the main driver for sustainable water management.
- **Training and capacity** is a key for sustainability
- **Web and cloud solutions** will soon be the “standard” approach for water management tools (no local installation, fast implementation of new features, bug fixes etc.)
- **Difficult to make globally applied solutions** – local or regional knowledge is often required – toolbox to be used as a starting point for sustainable water management

- **Decisions driven by data alone**
- **Increased access to data** will pave the way for new and more efficient use of data in water management
 - Machine learning, artificial intelligence, optimisation methods etc.
 - Increased use of cheap sensors and satellite based information
 - Local enterprises will utilise data for new solutions
- **Information sharing** across national boundaries and agencies
 - Transparency in investments and solutions

Transforming Data into Operational Decisions



Optimised real-time control of water systems

- Reduce flood risk
- Optimise water use and minimise spills
- Meet regulatory requirements on water quantity and quality
- Reduce costs of new water infrastructure



Reduced flooding



More hydropower



Efficient water
use



Environmental
protection



Reduced costs

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For more information, contact

DHI, Oluf Zeilund Jessen
ozj@dhigroup.com

IWA, Katharine Cross
katharine.cross@iwahq.org

Or learn more at

fdmt.iwlearn.org

