FLOOD & DROUGHT MANAGEMENT TOOLS

Component 1 – Development of an methodology

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Components

Component 1
Development of a methodology

Component 2
Application in pilot basins

Component 3
Validation and testing at local level

Component 4
Capacity building and communication
Outcomes – Component 1

**Outcome 1.1:** Methodologies with tools aimed at increasing understanding of flood and drought dynamics and impacts at transboundary and local levels and including enhancement of commonly used decision support systems, fully developed jointly with pilot basins stakeholders.

How do we design the functionality of the project outputs so it assists decision makers in incorporating flood and drought issues into planning?

**Output 1.1.1:** Methodologies using tools adopting a basin and local approach, including enhancements for a decision support system, that would allow the integration of flood and drought issues into (i) the TDA-SAP GEF IW or equivalent processes, and (ii) IWRM plans and Water Safety plans.
Background

- Facilitating a scientific approach to decision-making (TDA/SAP, WSP etc.)
- Support decision processes at basin and local level
- Technical tools supporting the inclusion of flood and drought issues into existing planning processes

Implemented by UNEP
Executed by IWA and DHI
2014 to 2018
Types of planning supported

Operational planning

Short-term and seasonal management
Climate variability and water management
National, basin or catchment planning

Strategic planning

Long-term investments
Climate change and population growth
TDA/SAP, IWRM
Background

Steps for designing the functionality of the project outputs:

1. Need assessment based on 50+ stakeholder meetings, workshops etc.
2. Awareness workshops bringing key stakeholders together
3. First round of technical training in all pilot basins
4. Development of specific applications based on user feedback
5. Testing and validation through a number of specific use cases
6. Technical training within the pilot basins during 2017 and 2018

User oriented development!
Project methodology – web based portal

www.flooddroughtmonitor.com

Flood and Drought Management Tools Project
Project methodology

What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?

What data can be used to calculate the indicators?

Agricultural impact

What is the level of drought risk in my area?

Drought assessment

Locate and identify hazards, estimate impacts and provide risk assessment.

Crop application

Visualise crop calendar, estimate crop water requirements, crop yield.

Flood assessment

[Under development] Locate and identify hazards, estimate impacts and provide risk assessment.

How can results and data be disseminated?

What are the planning options to address issues and impacts?

What procedures are needed to address risks to water supply?
Key activities in 2018

WEB based applications

– Finalise the development of web based applications supporting the planning processes

Technical workshops, trainings and webinars within the pilot basins

– User feedback used for further improvements
Overall Methodology

Specific and targeted apps
- Number of very specific apps each targeting a technical area
- Simplified functionality within each app
- Each app works as a stand alone and supports the overall methodology

WEB based platform
- Bug fixing and improvements are available for all users at the same time
- No local installations
- Internet access required
Project methodology – web based portal

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: www.flooddroughtmonitor.com

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 WRM 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 in-depth 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

[Image of Flood and Drought Portal website screenshots]
Project methodology – web based portal

www.flooddroughtmonitor.com
Project methodology – web based portal

www.flooddroughtmonitor.com
Project methodology – web based portal
Project methodology – Issue Analysis

What are the issues and underlying causes in my area?
Objectives:
- Identify the key environmental issues
- Understand the causes behind the issues

**Stakeholder facilitation tool used in the early planning stages**
Project methodology – Water Indicator

What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?
Project methodology – Water Indicators

Climate Vulnerability Index

**Description**

The Climate Vulnerability Index (CVI) is used as an integrated assessment of local vulnerability to water-related risks. It is a composite indicator, determined as a function of climate exposure, resilience, and adaptability. The CVI takes into account a wide range of relevant factors to capture the key drivers of human vulnerability to climate-related impacts on water resources.

**Keyword**

climate change adaptation, freshwater availability, water scarcity, water stress

natural resource management, sustainable livelihoods, irrigation, agricultural development

water related hazards, disaster planning, disaster management, disaster preparedness, health

**Metadata sheet**

**Title**
Climate Vulnerability Index

**Category**

Climate

**Subcategory**

Climate Vulnerability

**Purpose**

The Climate Vulnerability Index (CVI) is used as an integrated assessment of local vulnerability to water-related risks. It is a composite indicator, determined as a function of climate exposure, resilience, and adaptability. The CVI takes into account a wide range of relevant factors to capture the key drivers of human vulnerability to climate-related impacts on water resources.

**Policy Relevance**

This indicator is relevant for identifying regions or populations that are vulnerable to climate change impacts in relation to water resources. It can be useful in prioritizing policy actions related to disaster planning and preparedness, as well as natural resource allocation. When combined with socioeconomic or demographic variables, the CVI may help to identify trends in equity and may contribute to poverty reduction efforts. Reported data on this indicator supports ongoing assessment of climate-related risks and strategic action to combat human vulnerability to climate change.
Project methodology – Water Indicators

Flood and Drought Management Tools Project
Objectives:
• Identify the relevant water indicators for the key environmental issues
• Facilitate stakeholder agreement on monitoring and evaluation indicators

Selection of few relevant water indicators for monitoring and evaluation
What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?

What data can be used to calculate the indicators?

- Access to near real-time data
- Climate forecast and climate change data
- Flood and drought indices
Project methodology – Data and Information

Select/unselect the available data types

Data

Legend for selected data types

Tools

Data availability

Current time step
Objectives:
- Data availability – historic, near-real time, forecast and projected
- Free access to basic dataset for water related planning

*Facilitate improved decision making*
Project methodology – Drought

What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?

What data can be used to calculate the indicators?

What is the level of drought risk in my area?

Issue Analysis
Causal Chain analysis and WRIAM, Unique and high priority issues

Water Indicator
Identify water related indicators to support analysis 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
Objectives:
• Drought hazard identification and early warning
• Drought risk assessment

Drought assessment and early warning
Project methodology - Crop

What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?

What data can be used to calculate the indicators?

What is the level of drought risk in my area?

Agricultural impact
Objectives:
- Crop related information source
- Assessment of crop water requirement and crop yield (current and future)

Impact assessment on agricultural sector
What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?

What data can be used to calculate the indicators?

What is the assessment of flood risk in my area?

What is the level of drought risk in my area?

Agricultural impact
Project methodology – Flood

Objectives:
- Flood related information base (flood maps, flood indicators…)
- Hydrograph calculation and evaluation (rainfall runoff)

Flood information and assessment
Project methodology – Basin Planning

What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?

What data can be used to calculate the indicators?

What is the assessment of flood risk in my area?

What are the planning options to address issues and impacts?

Agricultural impact

What is the level of drought risk in my area?
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.

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**PLAN**
Combination of investments and external factors

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<th>INVESTMENTS</th>
<th>EXTERNAL FACTORS</th>
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<td>Hydropower</td>
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<td>Environmental flow</td>
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**MODIFY**
Water demand and climate

**EVALUATE**
Multiple Criteria Analysis (MCA)
Objectives:
- Evaluate existing plans (basin, catchment, local…)
- Create new plans and evaluate

Facilitating basin planning for decision makers (non model experts)
Project methodology – Water Safety Planning

What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?

What data can be used to calculate the indicators?

What is the assessment of flood risk in my area?

What procedures are needed to address risks to water supply?

What is the level of drought risk in my area?

Agricultural impact

Flood and Drought Management Tools Project
Objectives:

- Support the WSP modules
- Provide new approach for WSP

Risk assessment across a water utility scheme (catchment to tap)
Project methodology – Reporting

What are the issues and underlying causes in my area?

What indicators can be used to monitor the state of the issues?

What data can be used to calculate the indicators?

What is the assessment of flood risk in my area?

What is the level of drought risk in my area?

Agricultural impact

How can results and data be disseminated?

What procedures are needed to address risks to water supply?

What are the planning options to address issues and impacts?

Flood and Drought Management Tools Project
Project methodology – Reporting

Objectives:
• Assist in generating user defined reports and bulletins
• Automated submission of reports and bulletins

Facilitate automated reports and bulletins
Status and next steps

- Development of all applications are finalized
  - Ongoing adjustments based on user feedback
  - Ongoing dissemination through webinars, workshops and training events

- Increased focus on dissemination and putting the project outcomes into context
  - Spin off projects and use of the web portal in a wide range of projects
www.flooddroughtmonitor.com

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