Training in the Demonstration Version of the Syr Darya Flood and Drought Monitor (SYR-FDM)

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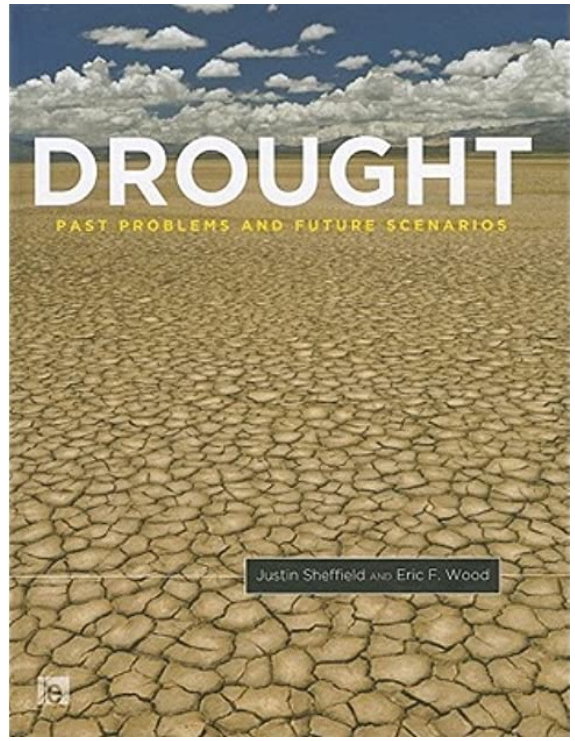
Who am I?

- Professor of Hydrology and Remote Sensing at Southampton since 2016
- Previously a researcher at Princeton University for 15 years
- Researcher at University of Newcastle for 8 years
- Written > 160 research papers and books on the hydrological cycle, hydrological extremes (droughts and floods), climate change, water resources, hydrological forecasting, …
- Interests in water resources, hydrological hazards and food security in developing regions



Our Related Research

How does the terrestrial hydrological cycle vary over diurnal to centennial time scales?

Is the hydrological cycle accelerating in response to global warming?

How are extreme events such as drought changing?

What are the mechanisms of drought development and recovery?

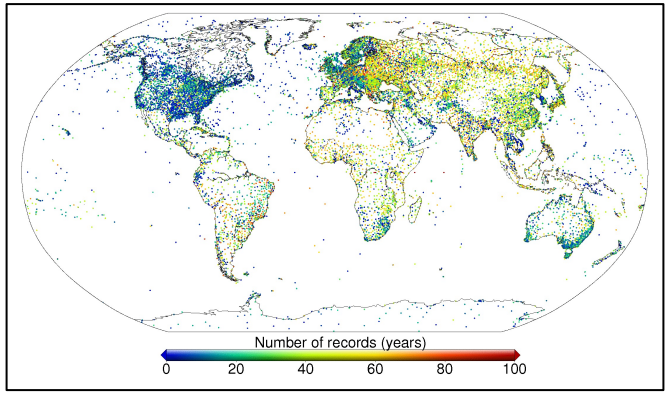
What are the uncertainties in future projections of hydrological change?

How do human activities feedback with the climate and water systems?

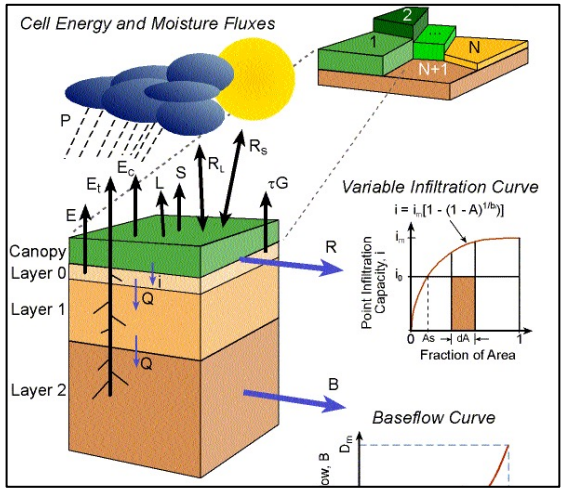
How can we use this research to improve societal resilience to short term climate variability and adaptation to long-term climate change?

Research Tools that We Use

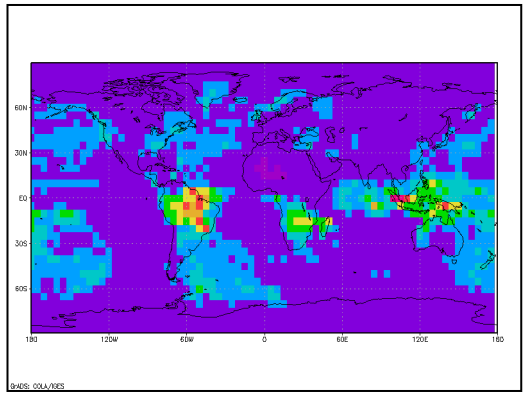
Ground Observations



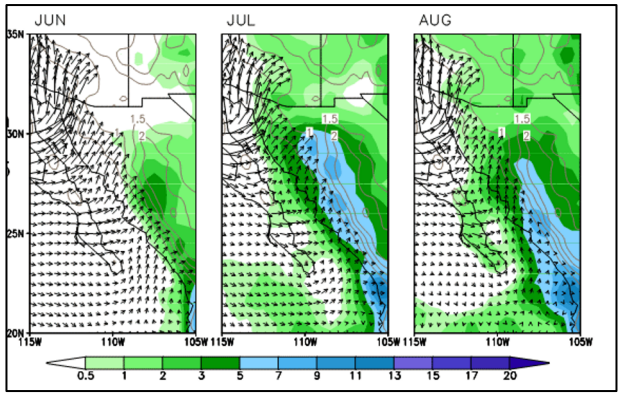
Land Surface Modeling

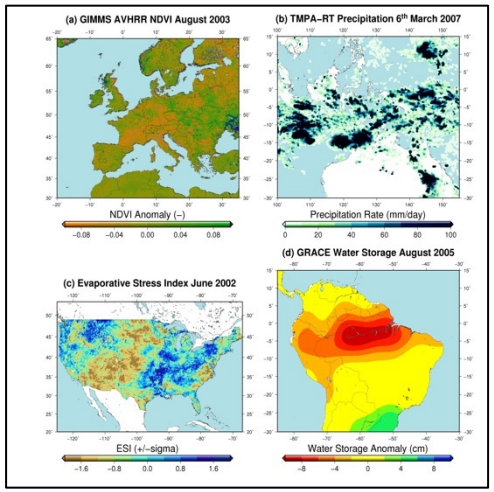


Climate Models

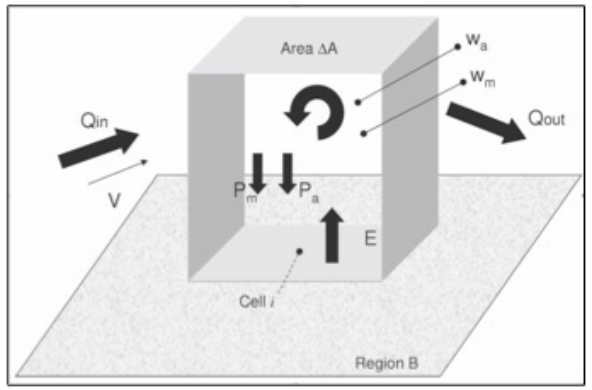


Reanalysis/RCM





Remote sensing



Diagnostic Tools

Overall Aim of the Training

- The overall aim of the programme is to introduce a demonstration system for estimating past, current and future flood and drought risk within the Syr Darya basin, and to understand user needs.
- The training will provide users with **a brief overview of flood and drought monitoring and forecasting**, and **hands-on guidance** in using the system to access, display and interpret information.
- It also serves to raise awareness of these approaches to monitoring, forecasting and early warning of hydrology and hydrological hazards and their benefits, and help strengthen capacity and collaboration.

Specific Objectives of the Training

1. To provide background in current approaches to monitoring and forecasting floods and drought, based on the latest modeling and satellite remote sensing technologies.

2. To provide training in accessing the system, navigating its functionality, and selecting and displaying the different types of data.

3. To provide training in the interpretation of the data, such as understanding variables and indices, analysis of the forecasts and understanding their uncertainty.

4. To provide training in selecting and downloading system information for use in other analysis and reporting activities.

How do we reduce the impacts of drought/flood?

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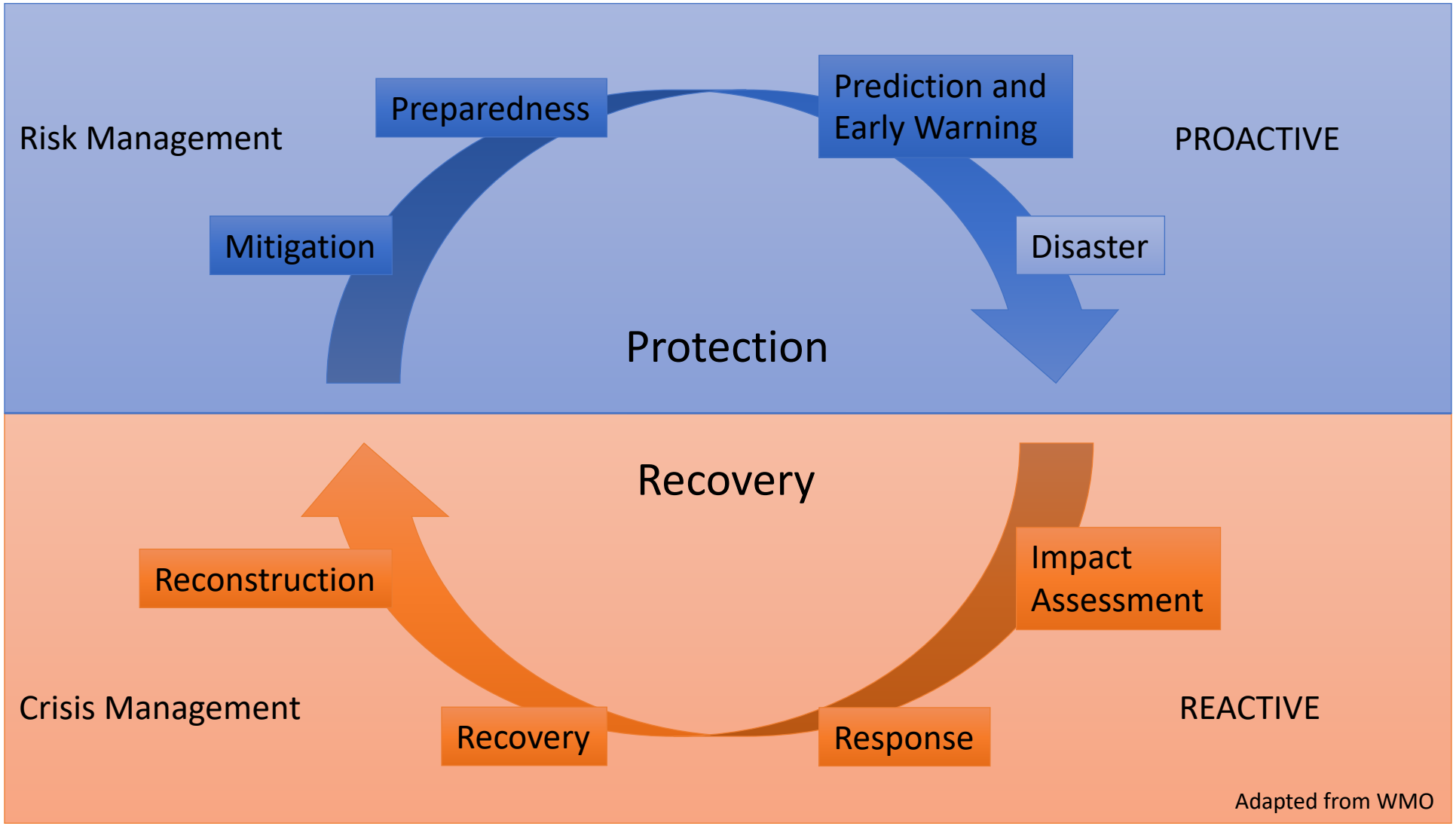


Reducing Impacts - Droughts versus Floods

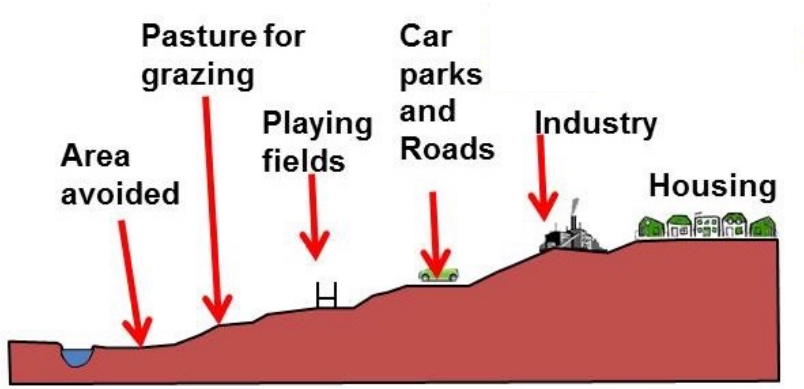
Approach	Drought	Flood
Modify the hazard	Impossible (?)	Flood prevention, e.g. afforestation, impervious surface removal
Modify susceptibility to damage	Water and crop management, e.g. reservoirs, drought tolerant crops	Flood protection, e.g. dams/dykes
Modify the loss burden	Limit losses, e.g. livelihood diversification, herd management, food aid	Limit losses, e.g. flood proofing, evacuation
Bear the loss	Financial protection, e.g. insurance policy	Financial protection, e.g. insurance policy

Globally, drought response and mitigation plans are less prevalent than for floods

Reducing Flood Risk – Non-Structural Measures

Flood forecasting and warning

Floodplain zoning

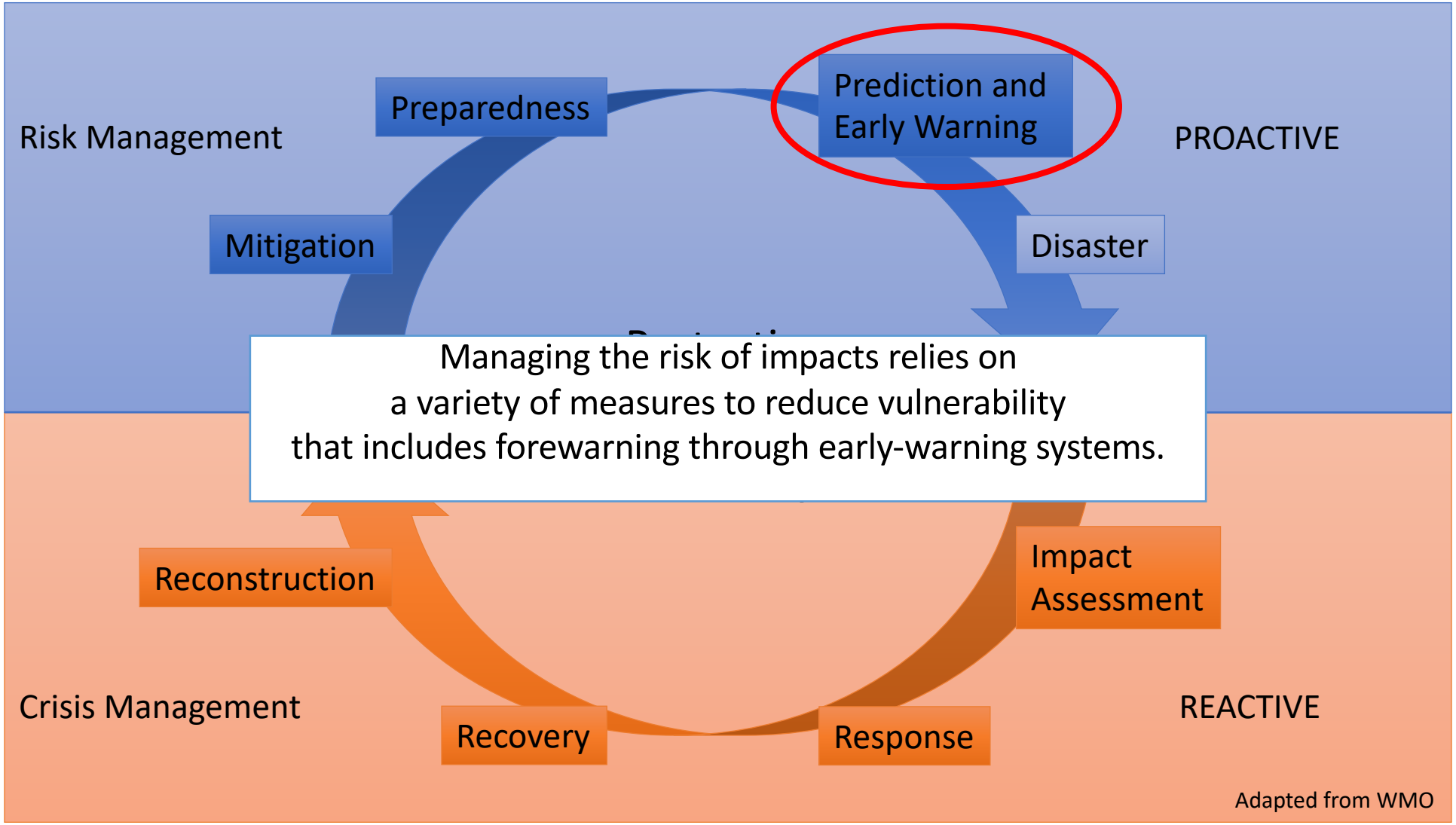


Flood fighting

Flood proofing

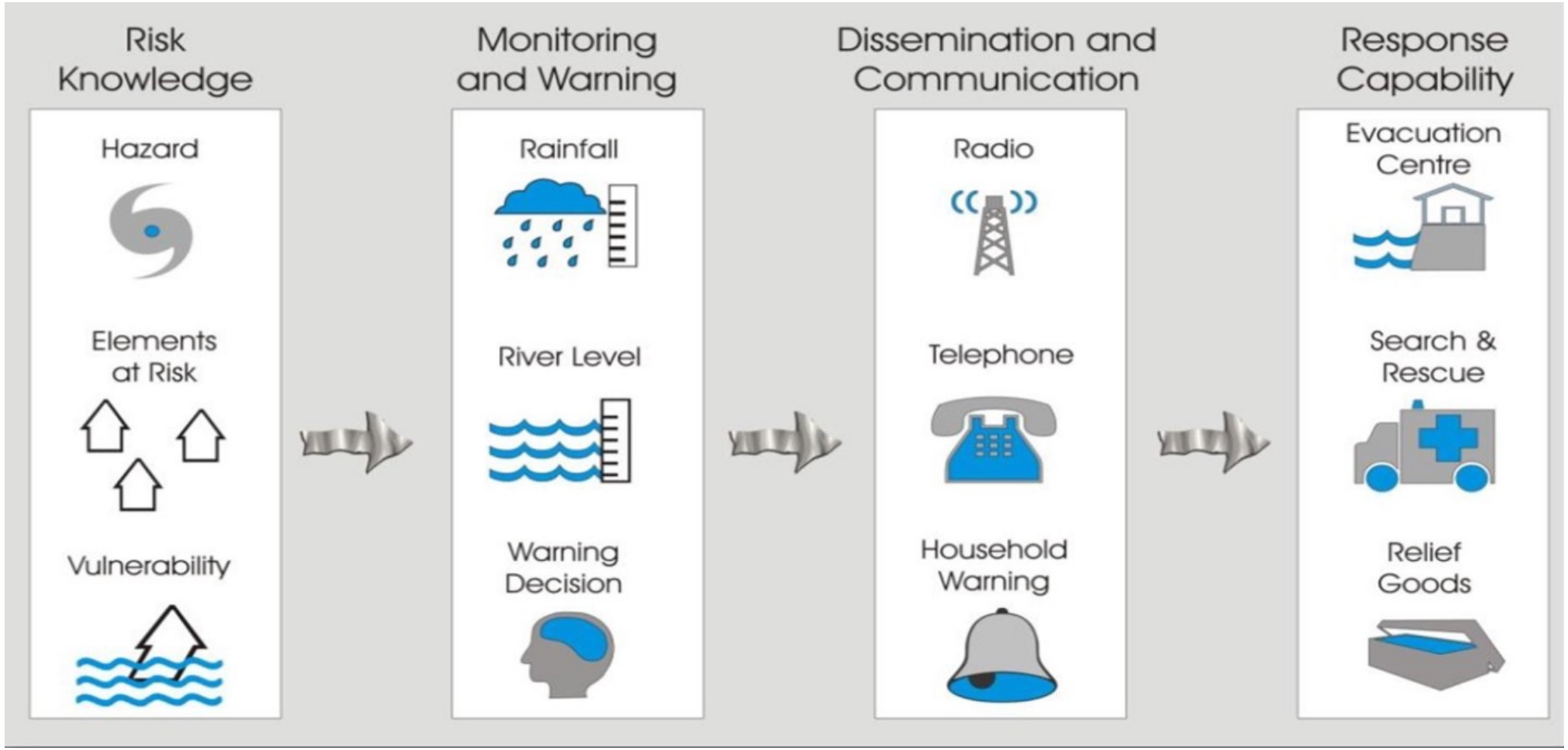
Flood insurance

Flood and Drought Prediction and Early Warning Systems



Flood and Drought Prediction and Early Warning Systems

Example for floods. Drought early warning systems operate similarly but the time-scales are much longer



http://floodproofing-vietnam.org.vn/en/activities/early-warning-system

Overview of the training

Session	Topic
1	**Introduction and overview**
2	**Overview of monitoring system, its purpose, technical background and some examples of use**
3	**A tour of the online system**
4	**Practical exercise in using the system**
5	**Feedback and Q&A. Discussion of potential ways forward**

Materials:

- Presentation slides on the introduction (pdf)
- Presentation slides on the overview lecture (pdf).
- A practical guide on the use of the system (pdf)

Format of the training

- Introduction
- Lecture
- Exercise
- Q&A
- Feedback

The training is intended to balance understanding of the methodological approach of the system and its data, with hands-on use of the system to access and analyze data, and subsequent use for potential decision making.

Any questions?