KULTURISK
RISK PREVENTION

Giuliano Di Baldassarre, UNESCO-IHE Delft
Introduction

Water-related Risk has increased worldwide (e.g. African floods)

(Di Baldassarre et al., Geophysical Research Letters, 2010)
Global changes

- Climate
- Population
- Land use, land cover
- De-forestation
- Urbanization
- Economic development
- Hydraulic works
- ...

- and many interdependencies/feedbacks

(Vorosmarty et al., Science, 2000)
Hyogo Framework (2005)

Need to reduce our vulnerability to disasters

Reducing disaster risks through science (UN-ISDR)

(World Bank, The Economics of Effective Prevention, 2010)
Disasters in Europe

Disasters are causing more and more damages

**Water-related disasters were the most costly**

Disasters in Europe

Examples of EU policies and actions

- Floods Directive
- Seveso II Directive
- Community framework in disaster prevention within EU
- Risks assessment and mapping guidelines
Developing a Culture of Risk Prevention in Europe
Evaluating the benefits of different measures
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FP7 Collaborative Project
January 2011 – December 2013
Total Budget 4.45 M€ (EC contribution 3.22 M€)
11 partners from 6 countries
Water-related disasters

**Urban fluvial flooding**
- excessive rainfall, snowmelt

**Urban pluvial floods**
- excessive (local) rainfall
- impeded drainage

**Coastal floods**
- high tides & surge, wave action

**Levee Breach**
- failure or overtopping of dikes

**Flash floods & Landslides**
- high intensity rainfall
- fast responding catchments
Traditional approach

Risk = Probability * Consequences

> “Levee effect”

(FP6 FLOODsite; Jonkman, 2010)
Current approach

From Flood Defense to Flood Management
Living with floods instead of Fighting floods

e.g. UNESCO–IFI, Flood Directive, “Room for the river”, “Making Space for Water"

(Pictures sources: Pierpaolo Campostrini and Micha Werner)
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- **Prevention as sensible investment**: the costs of preventive measures are less than those of post-event recovery
- Demonstration via case studies
- Analysis of different types of preventive measures
# KULTURisk case studies

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Water-related hazards</th>
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</thead>
<tbody>
<tr>
<td>Alpine catchments</td>
<td>Small catchments</td>
<td>Floods &amp; Landslides</td>
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<tr>
<td>Danube</td>
<td>Trans-boundary large river</td>
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<td>Mountainous catchment</td>
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<td>Somerset</td>
<td>Coastal area</td>
<td>Storm surges</td>
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Early Warning Systems

(Ranzi et al., 2009; Thielen et al., 2009; Demeritt et al., 2010)
Risk Communication

False alarms

Missed events

(source: David Demeritt)
Risk Preparedness

Prague (Czech Republic)

- 2002 flood, although significantly more intense than the previous one occurred in 1997, led to a smaller number of flood-related fatalities

(Marešová & Mareš, 2003)
EFAS-KULTURisk Workshop

- Large number of operational EWS
- Significant technical progress has been made so far

**But...**

- Exploit the benefits of EWS for risk reduction
- Need for cooperation and information exchange on EWS
- Including EWS into policies and risk management plans
- Easily accessible and understandable warnings
- Appropriate training
Structural measures

Water retention and storage (flood attenuation)
“Room for the River”

(Dutch project “Room for the River”; Brilly, 2001; Di Baldassarre et al., 2009)
Mapping and planning

- Flood mapping > Land-use planning
  Challenge: visualizing uncertainty

- Risk transfer (insurance)
  Significant differences in European countries

(Bates et al., 2005; Pappenberger et al., 2007; Di Baldassarre et al., 2010)
Summary

WP1. Methodology to evaluate the benefits of risk prevention

Application to water-related hazards

WP2. Early warning systems and preparedness

WP3. Non-structural prevention measures (mapping, planning & risk transfer)

WP4. Structural prevention measures (disaster defence)

WP5. Risk communication & dialogue with stakeholders

WP6. Validation and generalisation of the methodology

WP7. Dissemination and training

WP8. Project coordination