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Multi-hazard risk assessment and risk management planning

Lessons from the MiSRaR, PRISMA and CRISMAS projects

Ruud Houdijk, ITINERIS health & safety

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The 'fashion' of multi-hazard

It's an international tendency:

- UNISDR Sendai: "understanding risk"
- EU guidelines for risk assessment and risk management capabilities

...but local level is key:

- Local level is most suited to combine DRM with action 'on the ground' in related fields such as spatial planning and community resilience
- Local level has a serious challenge: how to tackle this complex task if you have limited resources?

11 local governments, 3 EU projects

VRZHZ
Safety Region
South-Holland South
the Netherlands

ITINERIS health & safety
the Netherlands

Municipality of Mirandela
Portugal

Municipality of Aveiro
Portugal

Municipality of Stavanger
Norway

Province of Forlì-Cesena
Italy

Municipality of Tallinn
Estonia

Agency for economic development of the
city of Prijedor, Bosnia and Herzegovina

Ungheni District Council
Moldova

Euro Perspectives Foundation
Bulgaria

Stara Zagora Regional Economic
Development Agency, Bulgaria

Region of Epirus,
Greece

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Spatial mitigation

Good practice
Mirandela, Portugal
Single hazard risk analysis of forest fires

For the Portuguese municipality of Mirandela the risk of forest fires is very tangible. The municipality is located in the Northeast of Portugal, in the District of Bragança. Forest fires are one of the biggest risks in the Municipality. Historical research proved to be an important success factor for the municipality to get a grip on this risk. Annual registration of forest fires by the Municipality generated excellent insight in the occurrence of fires. Despite the high risk awareness of the population the principle causes of forest fires turned out to be human: use of fire in agriculture and barbecues during the weekend. With this insight the municipality was able to give specific risk education.

Registration and historical research also made it possible to project the spatial distribution of the yearly probability of forest fires on a risk map. On this risk map the territory also is divided into five classes of expected fire intensity, based on the land use, type of vegetation and the mountain slope. Another layer of the risk map can

Good practice
Aveiro, Portugal
Risk mapping for flooding

The municipality of Aveiro is located at the Atlantic coastal line of Portugal. Aveiro has a flooding risk caused by the Vouga River in combination with the Atlantic Ocean. The Vouga River originates in the hill of Lapa, about 930 m altitude. Its basin has an area of 3645 km^2. After a journey of 148 km it flows into a lagoon, called 'Ria de Aveiro', which communicates with the Atlantic Ocean. This lagoon surrounds and creates an interface through a network of canals on the northwest side of the city of Aveiro. During high tides and ocean storms the sea level temporarily rises, decreasing the draining capacity of the river. Often this coincides with heavy rain falls, raising the level of the river itself. In various cases in the past this has resulted in an actual flooding of the urban city centre and the surrounding lower rural areas.

To get a grip on this flooding risk the municipality of Aveiro started a project to gain more precise insight in the impact of a flood. The University of Aveiro was asked to

Handbook

Mitigating
Spatial Relevant Risks
in European Regions and Towns
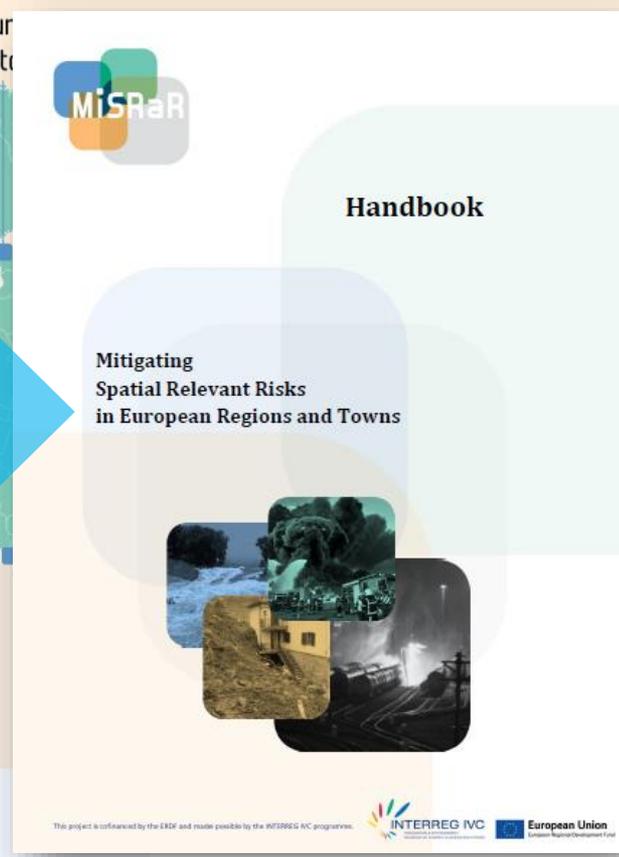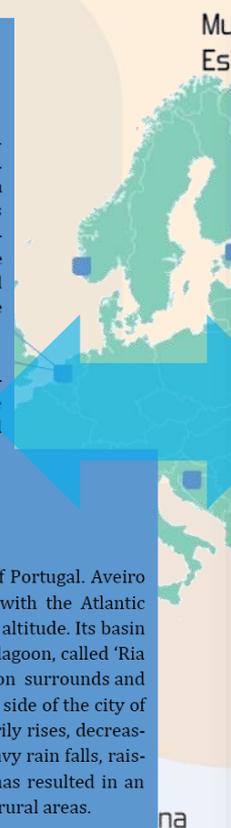
Sharing of good practices   Handbook

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Single hazard pilots

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Safety Region
South-Holland South
the Netherlands

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the Netherlands

Mirandela
Municipality of Mirandela
Portugal

aveiro
Municipality of Aveiro
Portugal

Tallinn
Municipality of Tallinn
Estonia
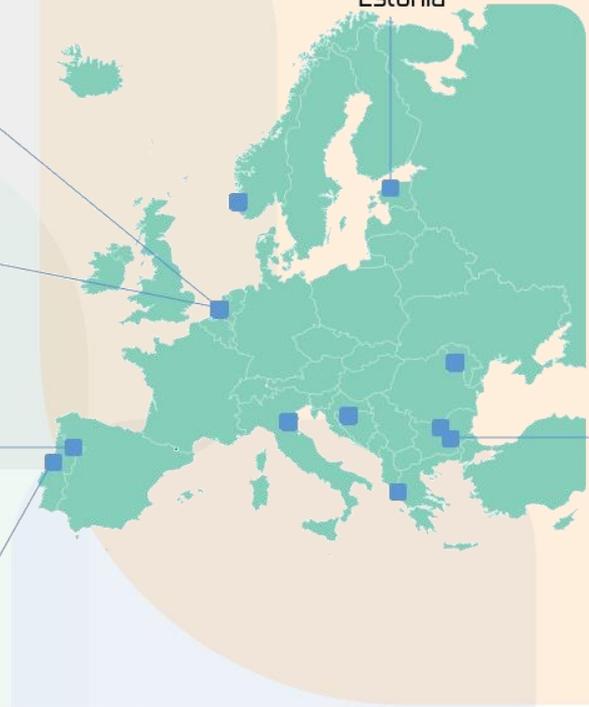
Stara Zagora Regional Economic
Development Agency, Bulgaria

'All hazard' implementation

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Ungheni District Council
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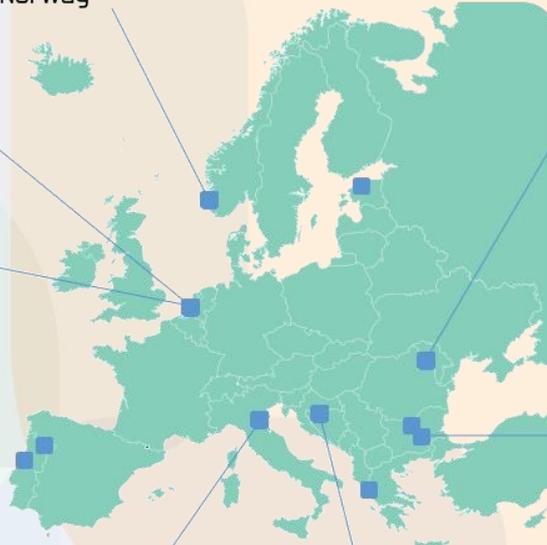
Province of Forlì-Cesena
Italy

Agency for economic development of the
city of Prijedor, Bosnia and Herzegovina

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Sharing lessons

- Coordination and cooperation
- Risk assessment:
  - Risk identification
  - Risk analysis
  - Risk evaluation
- Risk management planning
- Implementing DRM

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Starting point:
it's all about networking

Objectives:

- Coordination of the process
- Cooperation: sharing info and knowledge
- Transparency & accountability
- From shared insight to shared actions
- Building the science-policy interface

Some lessons:

- Early involvement is key
- Different sectors have different rhythms
- Maintain a network assessment
- Empower your stakeholders
- Use CBA to identify who pays and who benefits

All stakeholders invited for talks about forest fire prevention

Eh...

invitation

PvG

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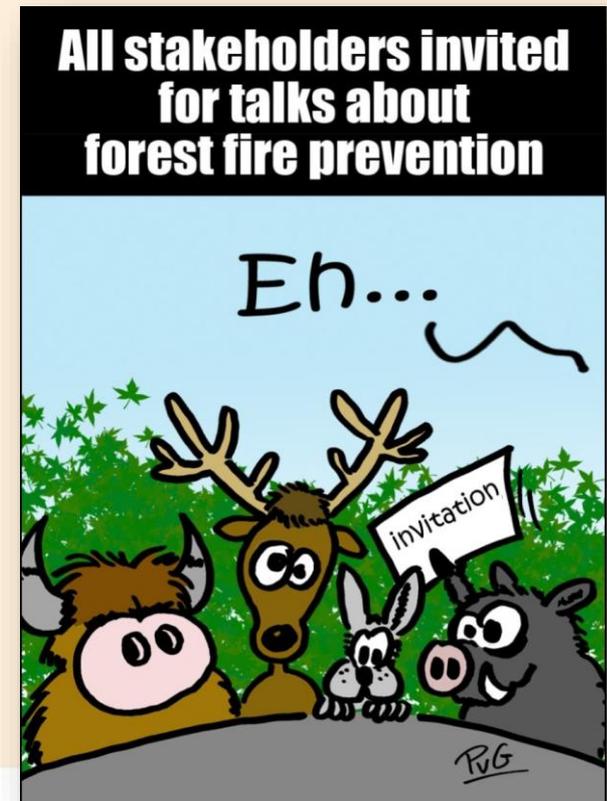
Lessons on risk identification

- Structural information management is key
- Local knowledge of practioners is as important as registered data
- Insight in the spatial distribution of hazard, exposure and vulnerability is needed to understand the local dimensions of risk and to make the connection with spatial planning
- Confidential information and institutional competence should not dominate the process

WE HAVE MAPPED ALL THE RISKS... FOR YOUR SAFETY!

LOOK AT THAT! THERE'S NO PLACE WE'RE SAFE !?!

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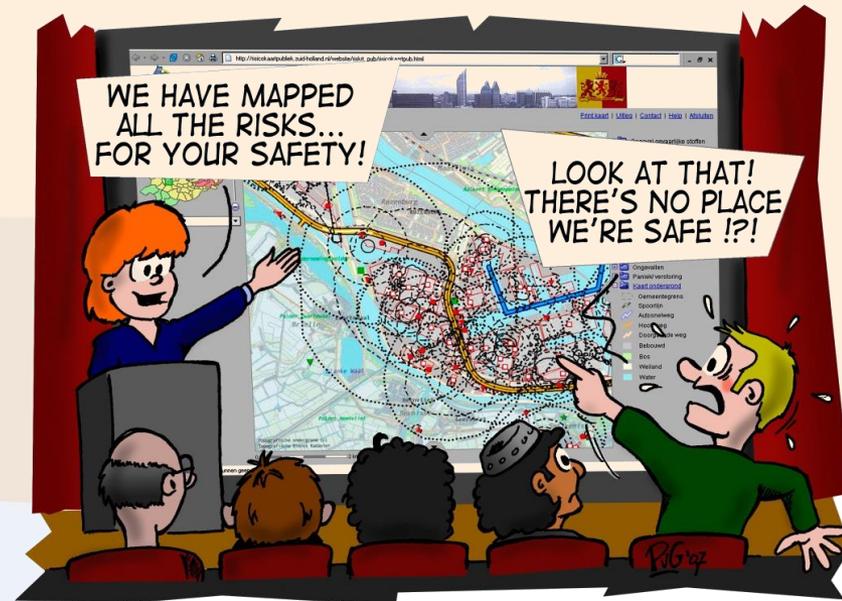
Lessons on risk analysis

- There is a gap between single hazard methodologies and multi-hazard methodologies
- Multi-hazard means multi-impact and multi-stakeholder
- Multi-criteria impact and likelihood analysis based on expert elicitation of scenarios is a 'reachable compromise' for local governments to compare different risks.
- An analysis of likelihood with high confidence levels is key for investment in spatial planning measures

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Example of methodology

Impact

	A	B	C	D	E
E	meltdown	severe flood		flu pandemic	
D	earthquake			cyber attack	
C		industrial accident		snow storm	power failure
B		disruption drinking water	riots		
A					

Likelihood

Impact criteria

Human impact

1.1 Casualties

1.2 Serious injured and ill

1.3 Displaced and lacking basic necessities

Economic impact

2.1 economic costs

Ecological impact

3.1 Damage and loss of environmental value

Impact on cultural heritage

4.1 Damage and loss of cultural heritage

Social political impact

5.1 Disruption of public order and security

5.2 Sociological and psychological impact

Each hazard category should be represented by at least 3 scenarios, to cover both intensive and extensive risks

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Lessons on risk evaluation

- Avoid interference in the 'objective' analyses

- Try to set political 'risk criteria' for the risk evaluation before start of the process

- "Don't put all your eggs in one basket": avoid too narrow prioritization

- Search for a shared 'dancing rhythm' with other sectors (like spatial planning), so the decision making 'fits'

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Lessons on risk management planning

- Search for inter-sectorial win-win situations

- Capability assessment with a free mind 'out of the box'

- Standardization and simplification of Bow-Tie analysis for scenarios

- If you are going to do Cost-Benefit Analysis: all-impact means a CBA needs to account for more than money alone

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Lessons on DRM implementation

- Risk governance: organize cooperation across administrative and sectoral borders

- Search for shared interests and goals with your stakeholders: form alliances & empower others

- Be aware of lobby and advocacy processes

- Be aware of and transparent about unintended side-effects (unrest, property value)

- Involve and activate citizens: always include public awareness and community resilience in a DRM strategy

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the **community** for **risk** management & **assessment**

Thank you for your attention!

visit the online community at:

www.crismaseurope.eu

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