EUROPEAN FORUM FOR DISASTER RISK REDUCTION
MACEDONIAN CHAIRMANSHIP

Disaster Resilience Index
– turning a concept into a tool –

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I. (Pilot) Disaster Resilience Index (DRI)

What is DRI?

According to the UNDP's Global Report: Reducing Disaster Risk – A Challenge for Development (2004), **DRI is a tool that enables** *:*

- *…calculation of the average risk of death per country in large- and medium-scale disasters …*

- *…identification of a number of socio-economic and environmental variables that are correlated with risk to death and which may point to causal processes of disaster risk.*

The Conceptual Model

Disaster risk is not caused by hazardous events per se, but rather is historically constructed through human activities and processes.

In the DRI, countries are indexed for each hazard type according to their degree of:

- ***Physical exposure***

- refers to the **number of people located in areas where hazardous events occur combined with the frequency of hazardous events**. It is not an indicator of vulnerability, but is a condition sine qua non for disaster risk to exist. Without people exposed to hazardous events, there is no risk to human life. (Physical exposure, however, is insufficient to explain risks.)

- ***Relative vulnerability***

Vulnerability is the concept that explains **why, with a given level of physical exposure, people are more or less at risk**.

In theory, vulnerability is modified by **coping capacity** and **adaptive capacity**. Vulnerability refers to the different **variables** (*economic, social, technical and environmental*) that make people less able to absorb the impact and recover from a hazardous event.

Key Steps Involved in Producing DRI
(as stated in the UNDP Report)

***Calculation of physical exposure*, meaning:**

- Calculation of ***physical exposure*** for each country and for each hazard
- Physical exposure varies both according to the number of people as well as to the frequency of hazard events
- Physical exposure is expressed both in absolute terms (the number of people exposed in a country) and in relative terms (the number exposed per million people).

***Calculation of relative vulnerability*, meaning:**

- Function of physical exposure to a hazardous event and vulnerability to the hazard
- When more people are killed with respect to the number exposed, the ***relative vulnerability*** to the hazard in question is higher
- Vulnerability to a given hazard depends on a range of social, economic, cultural, political and physical variables.

***Calculation of vulnerability indicators*, meaning:**

- The ***indicator of relative vulnerability*** for each hazard type developed in the DRI, presents a value which encompasses not only the different factors that increase the risk of mortality in a country, but also the factors that may decrease mortality.

Key Limitations to the DRI

(according to the UNDP Report)

1. The DRI represents **the risk of death (only),** *while disasters affect people's lives and livelihoods in many ways.*
2. The DRI examines **risks associated (only) with large- and medium-scale disasters**, *neglecting the risk from everyday hazards*
3. The DRI represents **risks associated with earthquakes, tropical cyclones and floods (only)** - *the DRI only represents the primary hazard events as recorded in global disaster databases, even when in some cases the majority of loss may be associated with a range of different hazard types triggered by the primary event.*
4. The DRI represents **period limited disaster risk data** (for the period 1980-2000 only)
5. The DRI tests **vulnerability indicators from available global datasets (only)** - *there may be other variables that potentially might help build a better correlation with risk, but for which no global datasets were available at the time of production of the DRI.*
6. The DRI **does not include indicators on disaster risk management and reduction** – *missing analysis of the comparative effectiveness of competing risk reduction strategies - conceptual work remains to be done in identifying key indicators for multiple hazard types operating in a range of socio-political contexts.*

UNDP Report – Six Emerging Agendas within DRR: Conclusions and Recommendations

1. **Appropriate governance** is fundamental if risk considerations are to be factored into development planning and if existing risks are to be successfully mitigated - *justifying expenditure in risk reduction will become easier as valuation techniques (including the DRI) that are available for indicating the positive contribution of risk reduction investments in development become more refined.*

2. Factoring risk into disaster recovery and reconstruction - *needed to mainstream prospective disaster risk management.*

3. Integrated climate risk management.

4. Managing the **multifaceted nature of risk** **-** *multiple hazards sources — economic, social, political, environmental.*

5. Compensatory risk management - *a need to improve disaster preparedness and response.*

6. Addressing **gaps in knowledge for disaster risk assessment** **–** *need for clear understanding of the depth and extent of hazard, vulnerability and disaster loss.*

II. Climate and Disaster Resilience Initiative & Climate Disaster Resilience Index

Building on the UNDP DRI Report, a **Climate and Disaster Resilience Initiative was launched** as an umbrella initiative of Kyoto University, funded by the Global Center of Excellence's "Human Security Engineering for Asian Megacities" Program and **aimed at establishing a Climate Disaster Resilience Index** (CDRI) to build resilient communities.

The objective of this study is to measure the existing level of climate disaster resilience of the targeted areas using a Climate Disaster Resilience Index (hereafter CDRI) which is developed considering **five resilience-based dimensions:**

- **natural,**
- **physical,**
- **social,**
- **economic**
- **institutional.**

National change over time or comparison between countries operating alternative risk management strategies can be used as an initial level of **analysis of the comparative effectiveness of competing risk reduction strategies** (including a do-nothing option).

III. Macedonian Contributions

Official Statement of the Government of the Republic of Macedonia, delivered at the Third Session of the Global Platform for Disaster Risk Reduction (**GPDRR**) and the World Conference on Reconstruction (Genève, 2011):

"Recognizing the direct linkage between climate change and natural disasters, the Republic of Macedonia is strongly committed to promoting the merging of risk reduction and adaptation efforts on a national, regional and global level, that implies the following:

1. development of **integrated risk assessment methodologies and procedures**;
2. establishing mutually interdependent:
   - disaster **prevention** standards,
   - **inspection** procedures,
   - **insurance** mechanisms;
3. **introducing "National Disaster Resilience Index" as international financial support eligibility criteria. "**

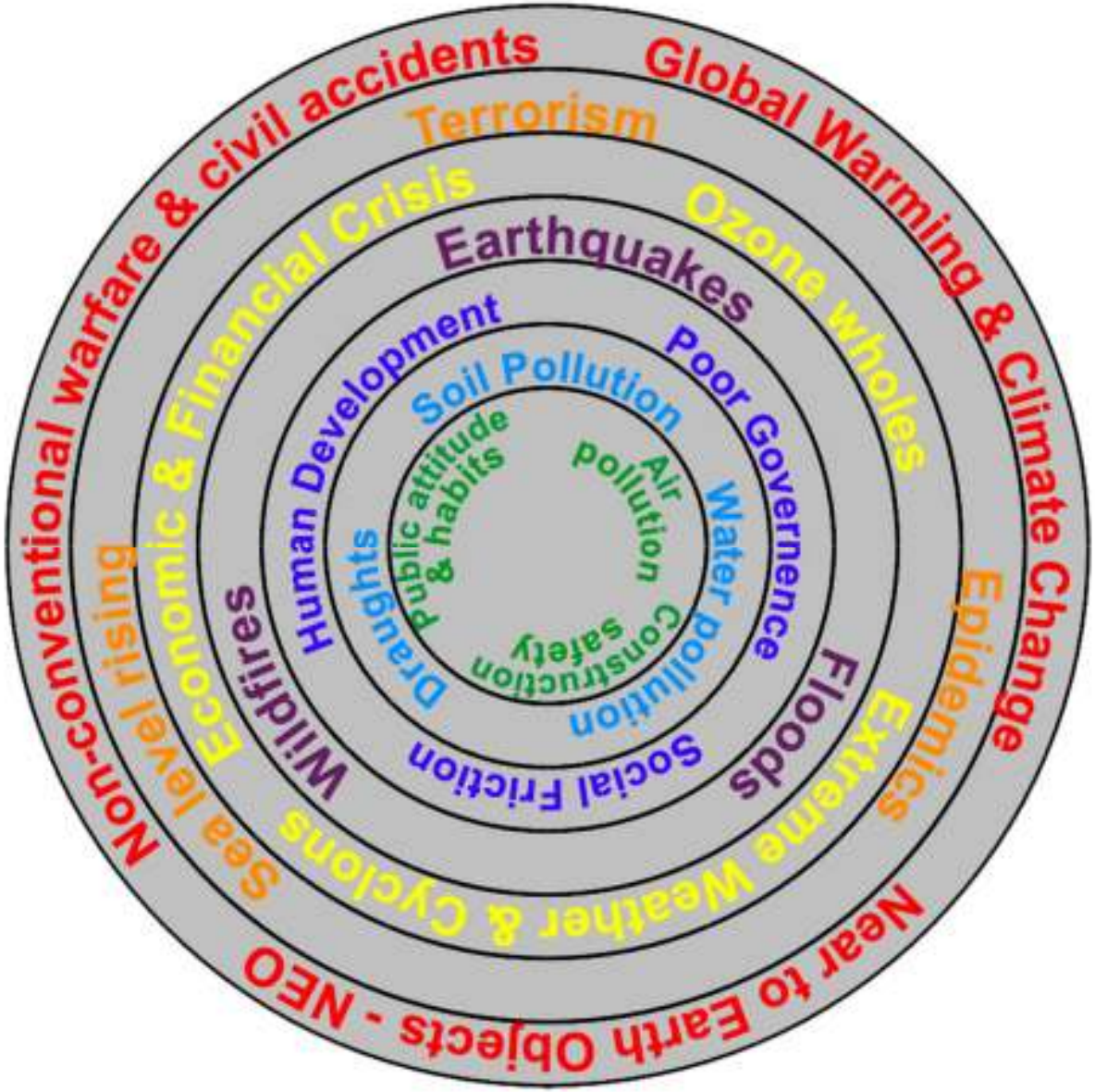
“Disaster Resilience Index”
or How to Turn a Concept into a Tool

Based on pledges given at the 3rd Global Platform, Macedonia proposes further improvement of the Disaster Resilience Index, which was initially introduced as a pilot concept in the UNDP 2004 Report.

DISASTER RESILIENCE INDEX

LEVELS:

- COMUNITY
- SUB-NATIONAL
- NATIONAL
- SUB-REGIONAL
  - Cross-border
- REGIONAL
- TRANS-REGIONAL
- GLOBAL



RISK EXPOSURE PROBABILITY INDEX (REPI)

The Risk Exposure Probability Index (REPI) as a "building block" in the Disaster Resilience Index **depends on the crosscutting relative values of the following indices**:

- **NATURAL THREATS INDEX** (NTI) based on the assessment of :
  - Severity (...HOW MUCH?)
  - Frequency (...HOW MANY?)
  - Extension (...WHERE?)
  - Unpredictability of a natural threats itself (...WHAT IF?)

- **INSTITUTIONAL RESPONSE CAPACITY INDEX** (IRCI), based on the assessment of :
  - Organizational capacity (competences, responsibility loop, material, equipment, funds, insurance);
  - Expert capacity to predict, monitor, analyze and evaluate risk;
  - Administrative capacity to plan;
  - Operational capacity to act.

- **COMMUNITY VULNERABILITY INDEX** (CVI), based on the assessment of:
  - Public perception of risk;
  - Public perception of institutional and personal responsibility;
  - Public perception of mutuality and inter-connectivity & inter-operability;
  - Public attitude to be proactive

How to Turn "RISK EXPOSURE PROBABILITY INDEX" into "DISASTER RISILIENCE INDEX"

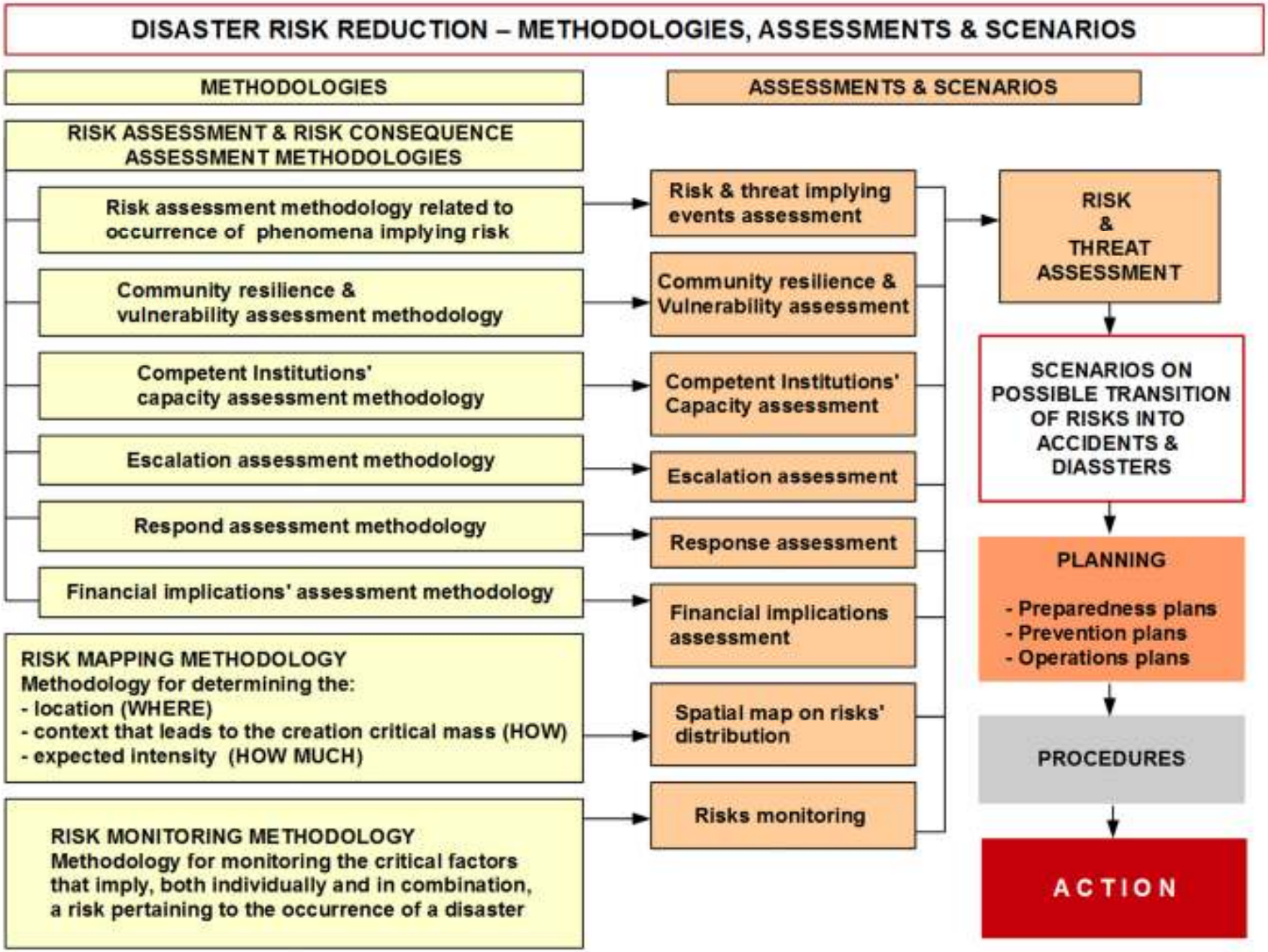
DISASTER RESILIENCE INDEX is a mirror image of the **RISK EXPOSURE PROBABILITY INDEX**, measuring both human and institutional capacities:

- **to act proactively,** to minimize risks from becoming disasters,
  or, if a catastrophic chain of reaction starts,
- **to react** in a sound and systematic manner to put the situation under control.

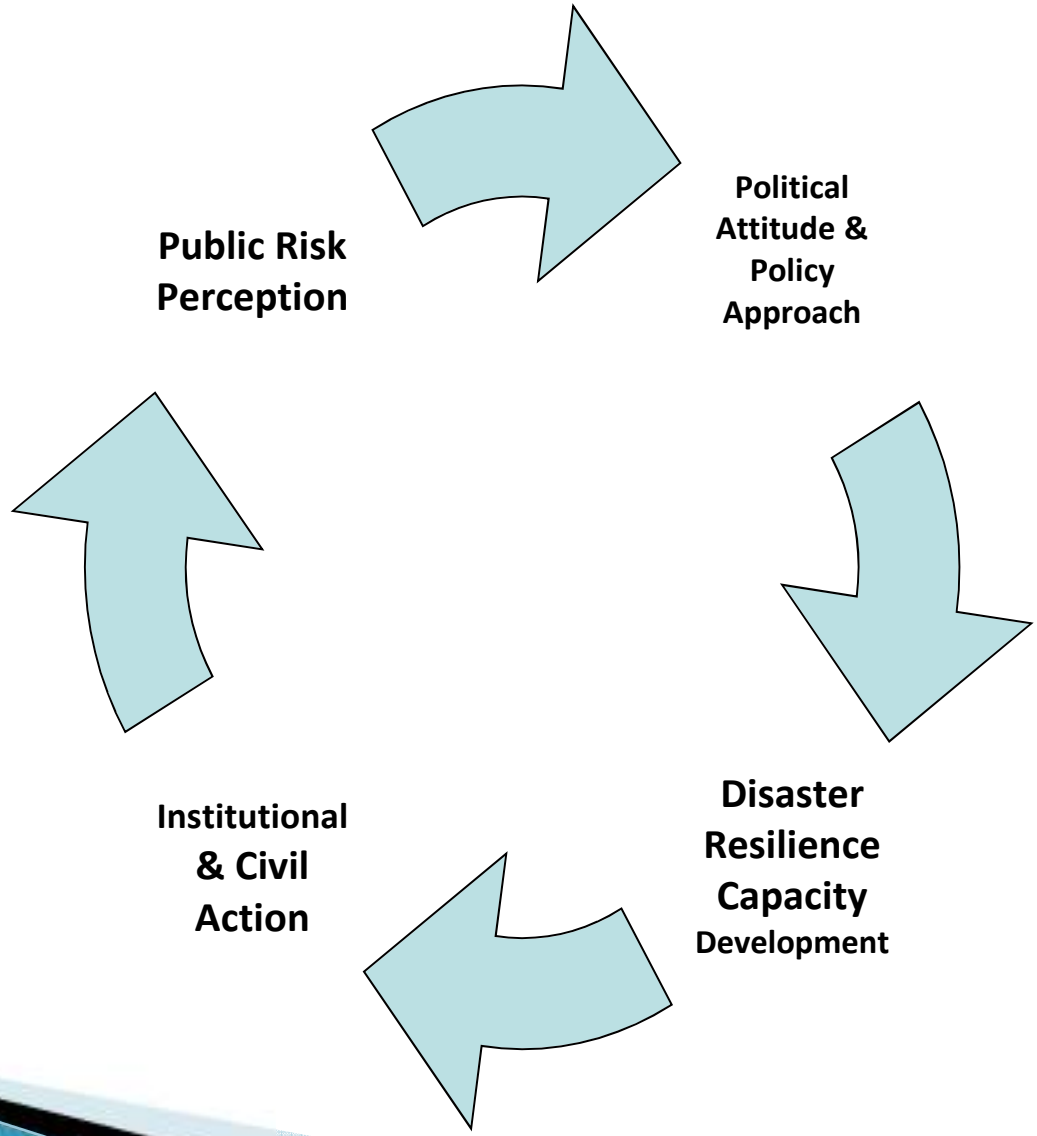
Key factors that turn the "Risk Exposure Probability Index" into the "Disaster Resilience Index":

- **Methodologically consistent analysis and expert-based evaluation** of "Risk into Disaster" transformation factors and circumstances
- Founded public **understanding of the possibility of a risk from becoming a disaster**, followed by strong attitude and sound political will for prevention
- Systematic and profound **implementation planning and execution**, both for prevention and reaction

(1) Risk sensitive and responsive public attitude, **(2)** Expert and human capacity development and availability, **(3)** national and international institutional "backbone" and "interfaces" networking, **(4)** equipment and technical capabilities and **(5)** financial advanced planning **are essential** and have to be there when you need them.


DISASTER RISK REDUCTION – METHODOLOGIES, ASSESSMENTS & SCENARIOS
METHODOLOGIES
ASSESSMENTS & SCENARIOS
RISK ASSESSMENT & RISK CONSEQUENCE ASSESSMENT METHODOLOGIES
Risk assessment methodology related to occurrence of phenomena implying risk
Community resilience & vulnerability assessment methodology
Competent Institutions' capacity assessment methodology
Escalation assessment methodology
Respond assessment methodology
Financial implications' assessment methodology
RISK MAPPING METHODOLOGY
Methodology for determining the:
- location (WHERE)
- context that leads to the creation critical mass (HOW)
- expected intensity (HOW MUCH)
RISK MONITORING METHODOLOGY
Methodology for monitoring the critical factors that imply, both individually and in combination, a risk pertaining to the occurrence of a disaster
Risk & threat implying events assessment
Community resilience & Vulnerability assessment
Competent Institutions' Capacity assessment
Escalation assessment
Response assessment
Financial implications assessment
Spatial map on risks' distribution
Risks monitoring
RISK & THREAT ASSESSMENT
SCENARIOS ON POSSIBLE TRANSITION OF RISKS INTO ACCIDENTS & DIASSTERS
PLANNING
- Preparedness plans
- Prevention plans
- Operations plans
PROCEDURES
ACTION

“Perception to Action” Circle



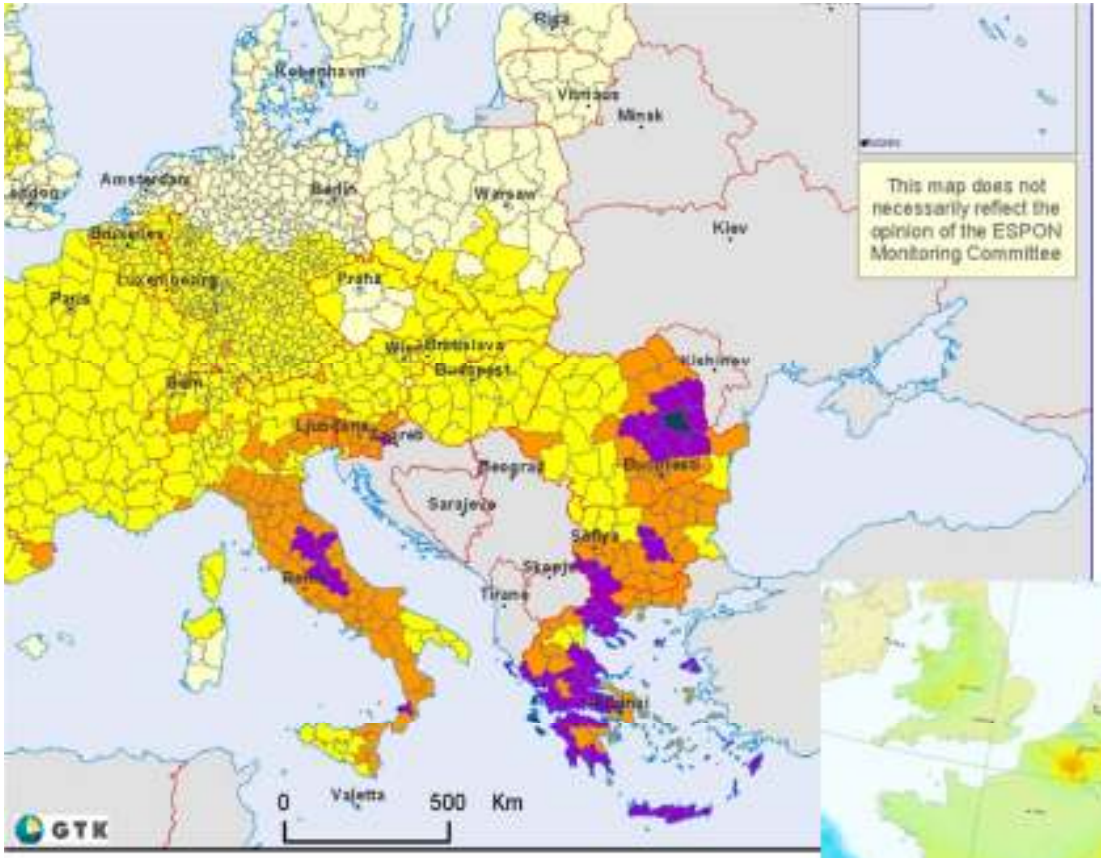
Hazard vs. Political Regional and Sub-regional Mapping

Shared risks require a unified DRR approach - the borders of regions and sub-regions should not be defined by political criteria (i.e. Europe, Asia, Africa…), but rather by the **criteria of shared risks and risk exposure**.

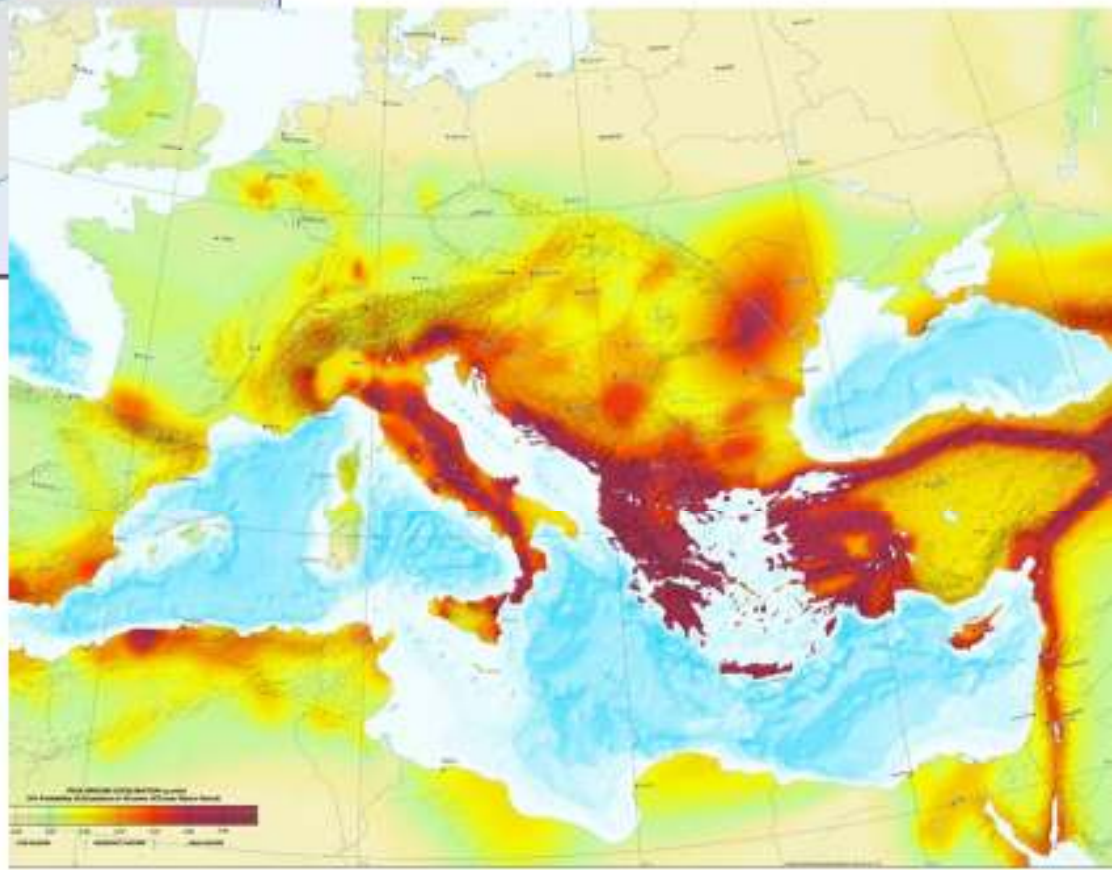
Shared risks provide a common ground for better understanding, cooperation and joint actions among the countries of a risk region or risk sub-region.

Risk region and risk sub-region do not necessarily correspond with the borders of a political region and political sub-region, and **depend on the type of risks**. In this sense, a country can be part of a number of risk regions.

Each country is part of several risk regions (such as "The Mediterranean Seismic Region" or "The Mediterranean Climate Region"…), **and sub regions** (such as "The Balkans Seismic Sub-region", as a part of "The Mediterranean Seismic Region")



Seismic Risk Region



"Politicized" Seismic Region

Introducing the "National Disaster Resilience Index" as International Financial Support "Eligibility" Criteria

...When governments are willing to receive, but unable to deliver...

- **The "National Disaster Resilience Index"** may be introduced as a **eligibility test** to countries within application criteria (preconditions) for international financial support.

- **The "National Disaster Resilience Index"** must consist of **transparent and measurable indicators** for establishing "**National Governance Credibility Rating**," explicitly related to fulfilling the "Good Governance Criteria":

Following the Rule of Law	Accountable
Participatory	Transparent
Consensus-Oriented	Responsive
Effective and Efficient	Equitable and Inclusive

Rational Behind the National Disaster Resilience Index

- The rational behind using the **"National Disaster Resilience Index"** as a **(mandatory or supplementary) eligibility test for international financial support** is the expected similarities between the behavior and responsibility of a particular government at home and its behavior in attaining financial support.
- **The "National Disaster Resilience Index",** if established, **will directly reflect on the terms of having international financial support**.
- **The "National Disaster Resilience Index",** if established, is expected **to be connected to insurance programs**, such as the South Eastern Europe Catastrophe Risk Insurance Facility.
- The UNISDR-sponsored **International Expert Group on "Disaster Resilience Index" Development should be established, with a clear mandate and timeframe** - ***Results*** *to be presented in the next (Forth) Session of the Global Platform for Disaster Risk Reduction*!!!

The Third Session of the Global Platform, convened 8-13 May 2011
"Invest Today for a Safer Tomorrow – Increased Investment in Local Action"

"By its very nature, the work of risk reduction may go unsung. The flood or earthquake one plans for may not happen for years, even generations. And when it does, success is measured by what does not occur: The school that did not collapse. The building that did not fall. The village that was not destroyed. But it goes far deeper. ***Your efforts are really about making sure that despite the fury and force of natural hazards, communities can continue to thrive ... families can continue to prosper ... children can continue to dream. That is the essence of your work. And there is nothing more meaningful than that."***

Ban Ki-moon, Secretary General of the United Nation

"Disaster risk is a reality of today, and a real threat for tomorrow. A threat that can be solved only by fulfilling the commitments and numerous pledges our governments have taken in past decades. ***It is the most important responsibility of this generation to hand over a less vulnerable world to generations to come, just as Noah did for mankind on the summit of biblical Mount Ararat."***

Dr. Gjorge Ivanov,
President of the Republic of Macedonia

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This is not the end of the story...
Please provide your inputs.
Let's do it together!
Thank you.