



Disaster Risk Management Knowledge Centre -DRMKC

Enhancing the Knowledge-based support to Disaster Risk Management

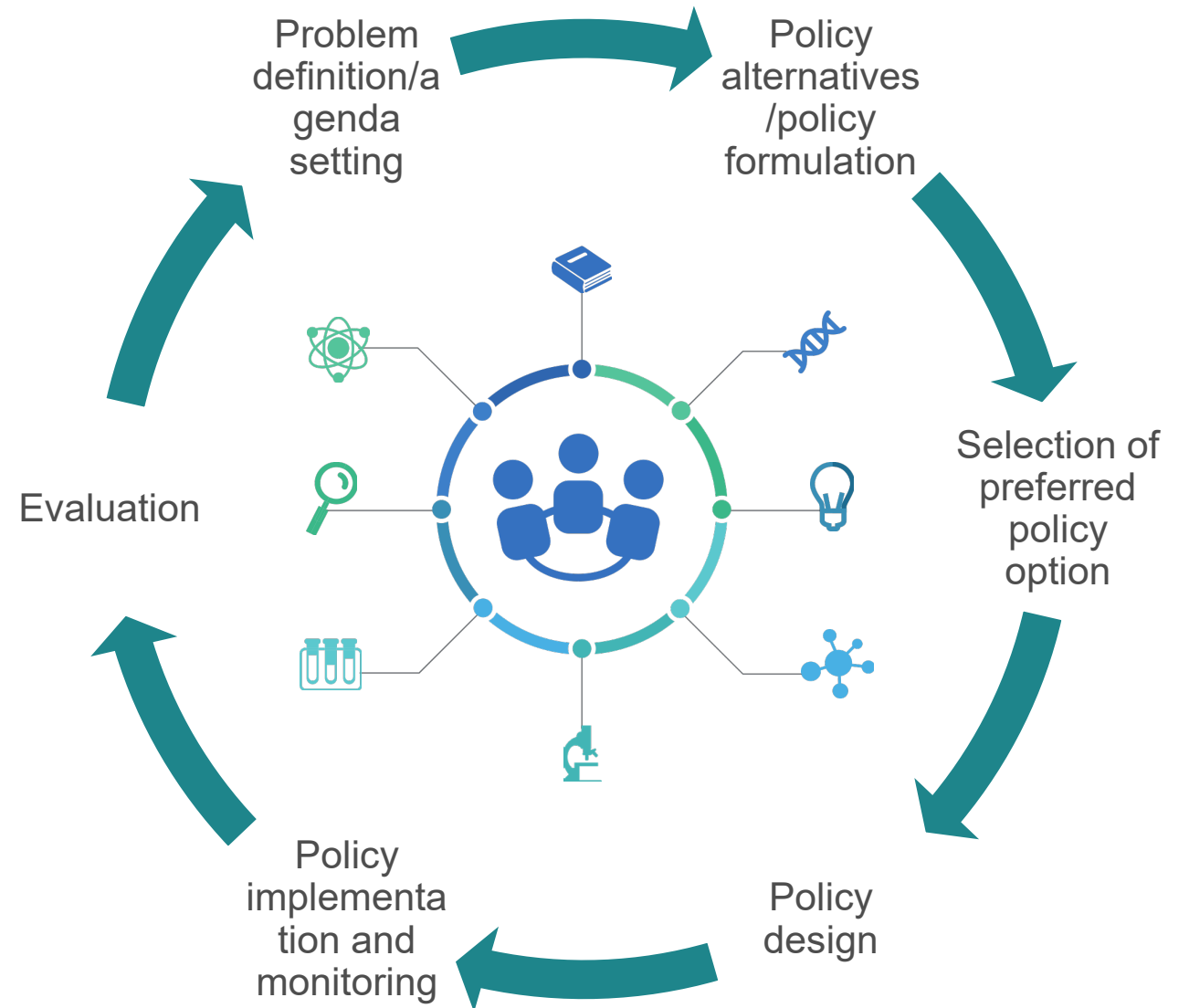


Ian Clark (Former Staff Member of JRC)

Joint Research Centre
the European Commission's
in-house science service

JRC Mission

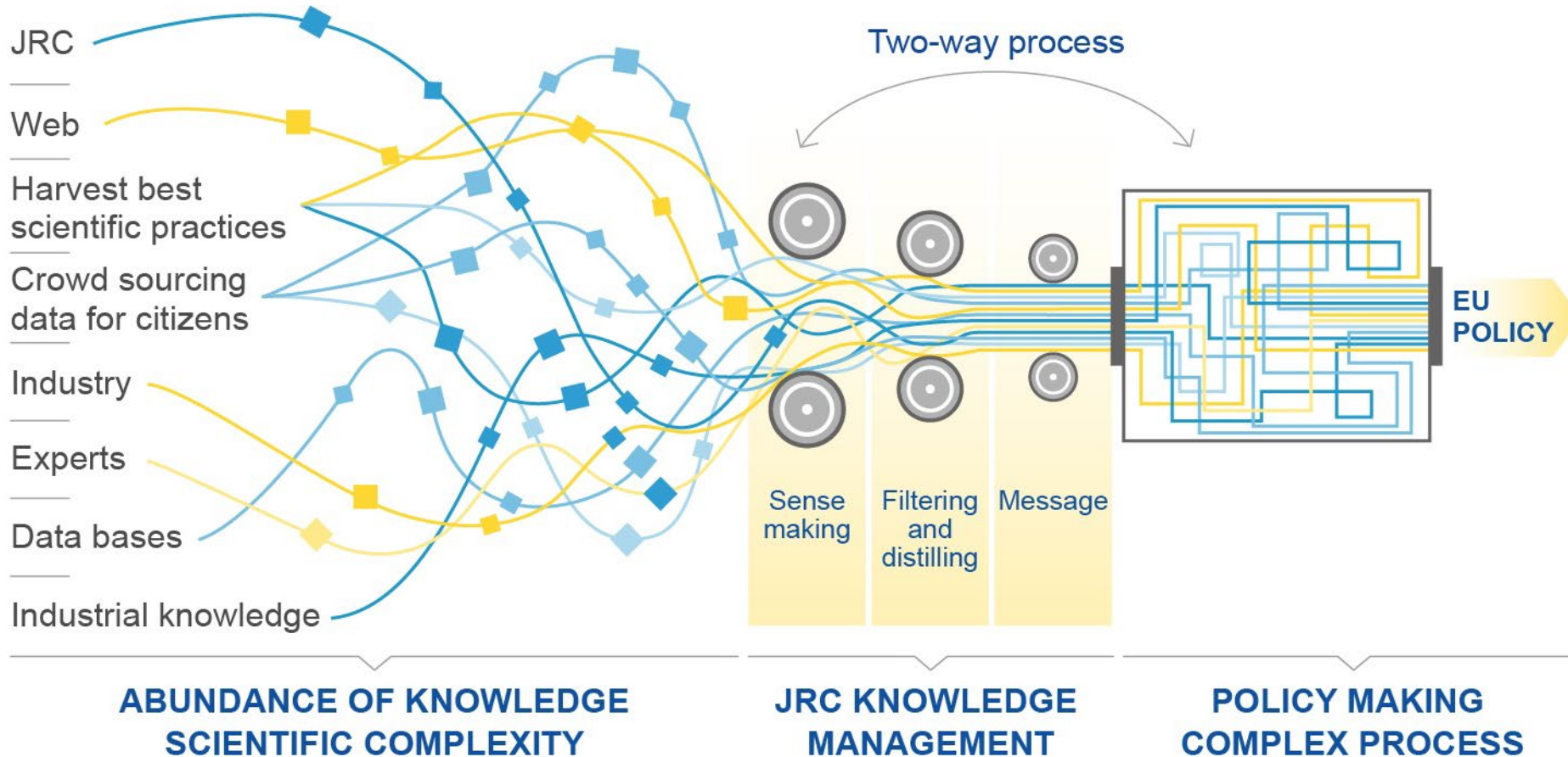
As the science and knowledge service of the European Commission our mission is to support EU policies with independent evidence throughout the whole policy cycle.



The European Commission's science and knowledge service
Joint Research Centre

JRC Strategy 2030:

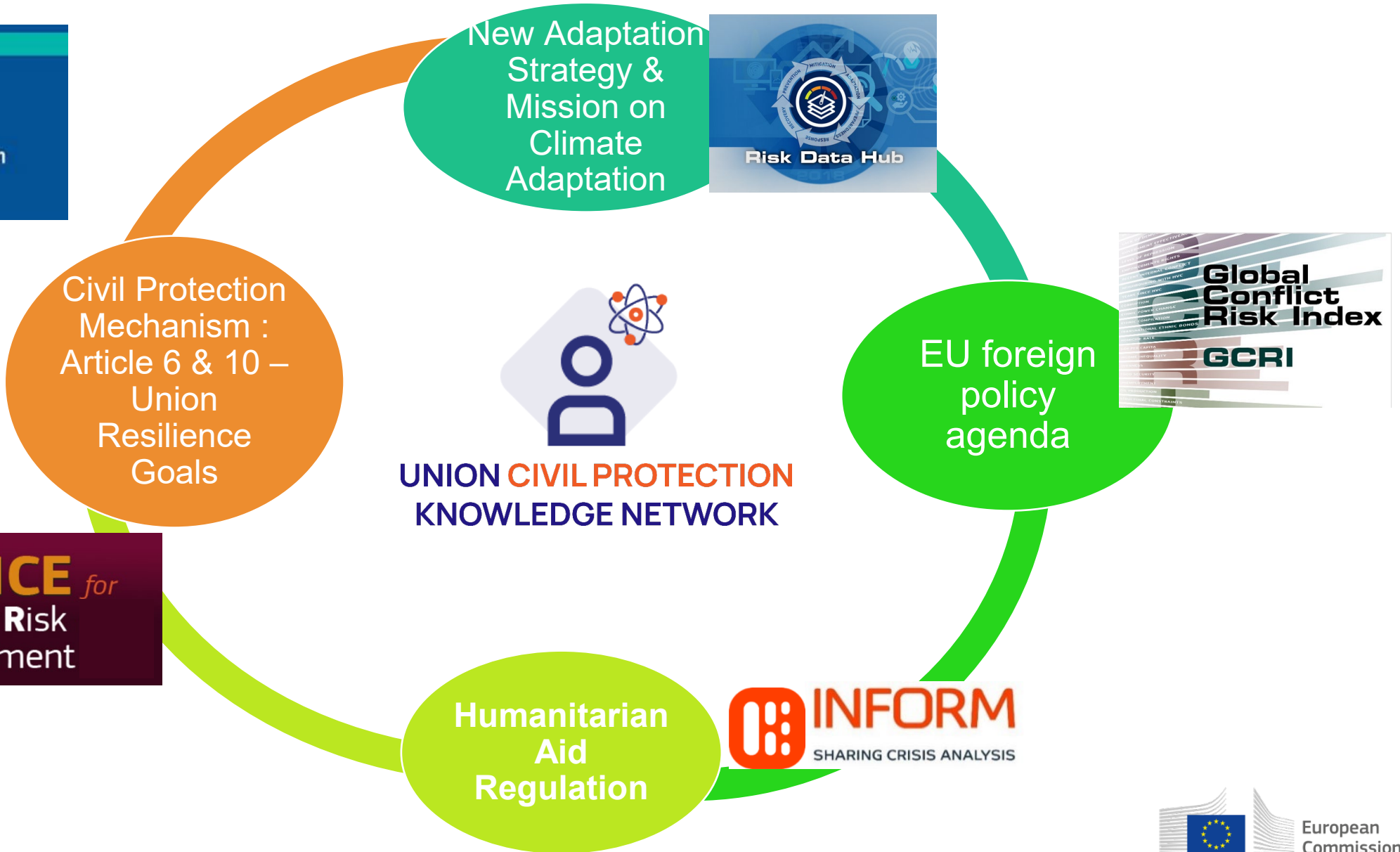
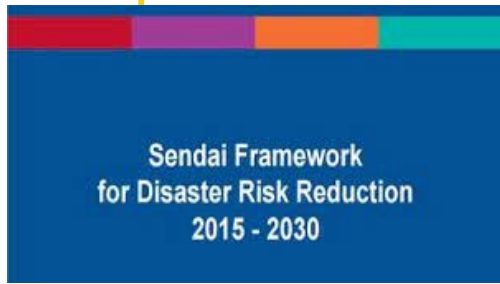
Creating Knowledge Centres to deal with the information overload



20 knowledge Services:

- **DRMKC**
- Biodiversity
- Territorial policy
- Migration and demography
- Bio economy
- Food fraud and quality
- Food and nutrition security
- Earth observation
- Cancer
- AI watch

Main policy areas supported by DRMKC



Evolution of DRMKC - triggered by broader policy context

2013 ● **New Union Civil Protection Mechanism**
Decision No 1313/2013, Art. 5.1(a)
Improve the knowledge base on disaster risks

2015 ● **SFDRR, SDGs, Paris Agreement**
Global agreements on DRR and Climate Change



launched on **30th September 2015**

2019 ● **Revision of UCPM**
Decision (EU) 2019/420
Creating rescEU and Union Civil Protection Knowledge Network

May 2021 ● **Revision of UCPM**
Regulation (EU) 2021/836
Cross-sectoral, all-hazard, transboundary DRM based on **scenario planning** and **disaster resilience goals** at Union level

Nov 2021 ● **Establishment of the Union Civil Protection Mechanism**
Decision ((EU) 2021/1956)

*“The **Science pillar** should build on and integrate existing scientific structures and networks ...in particular the **Disaster Risk Management Knowledge Centre**...as well as **relevant Horizon Europe programmes**...in the area of disaster risk management.”*



Pillar 2
Global Challenges and European Industrial Competitiveness

- Clusters
1. Health
 2. Culture, Creativity and Inclusive Society
 3. **Civil Security for Society**
 4. Digital, Industry and Space
 5. Climate, Energy and Mobility
 6. Food, Bio economy, Natural Resources, Agriculture and Environment

Joint Research Centre

The pillars of DRMKC

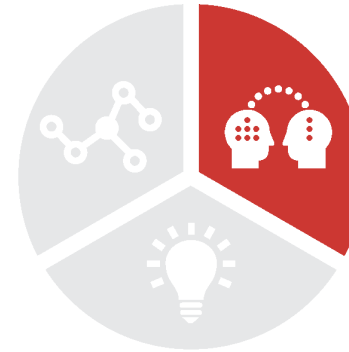
<https://drmkc.jrc.ec.europa.eu/>



PARTNERSHIP

Where knowledge begins
Where knowledge applies

- DRM networks
- DRMKC Annual Seminars
- DRMKC Community of Practice
- Knowledge Network of UCP



KNOWLEDGE

Where knowledge meets
Where needs are identified

- Gaps Explorer
- Project Explorer
- DRMKC Newsletter
- Science for DRM series of reports
- Recommendation for NRA



INNOVATION

Where gaps are filled
Where innovation is tested

- INFORM
- Risk Data Hub
- EIOS epidemic intelligence from open sources
- Global Conflict Risk index

DRMKC - Knowledge pillar

Improving collective knowledge to make better decisions

Science for DRM reports



Provide reviews of the scientific solutions in DRM for well-informed decision makers, practitioner and citizens

Recommendations for National Risk Assessments



Scientific support to Member States in NRA process

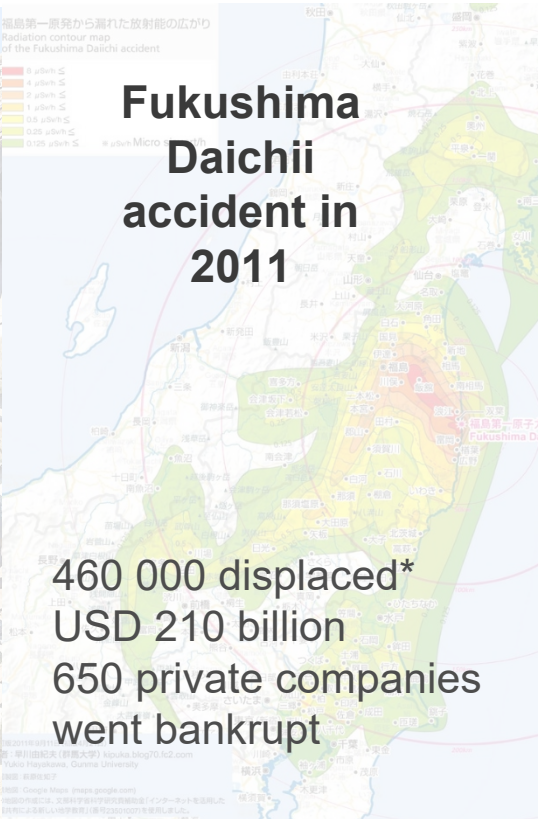
Science for Disaster Risk Management 2020

Super Case Studies



Earthquakes in Central Italy in 2016-2017

299 fatalities
430 injured
EUR 21 billion



Fukushima Daiichi accident in 2011

460 000 displaced*
USD 210 billion
650 private companies went bankrupt



Eyjafjallajökull eruption in 2010

48 % of Europe's total air traffic grounded
EUR 3.75 billion



COVID-19 emergency

3.99 million fatalities
184 million cases

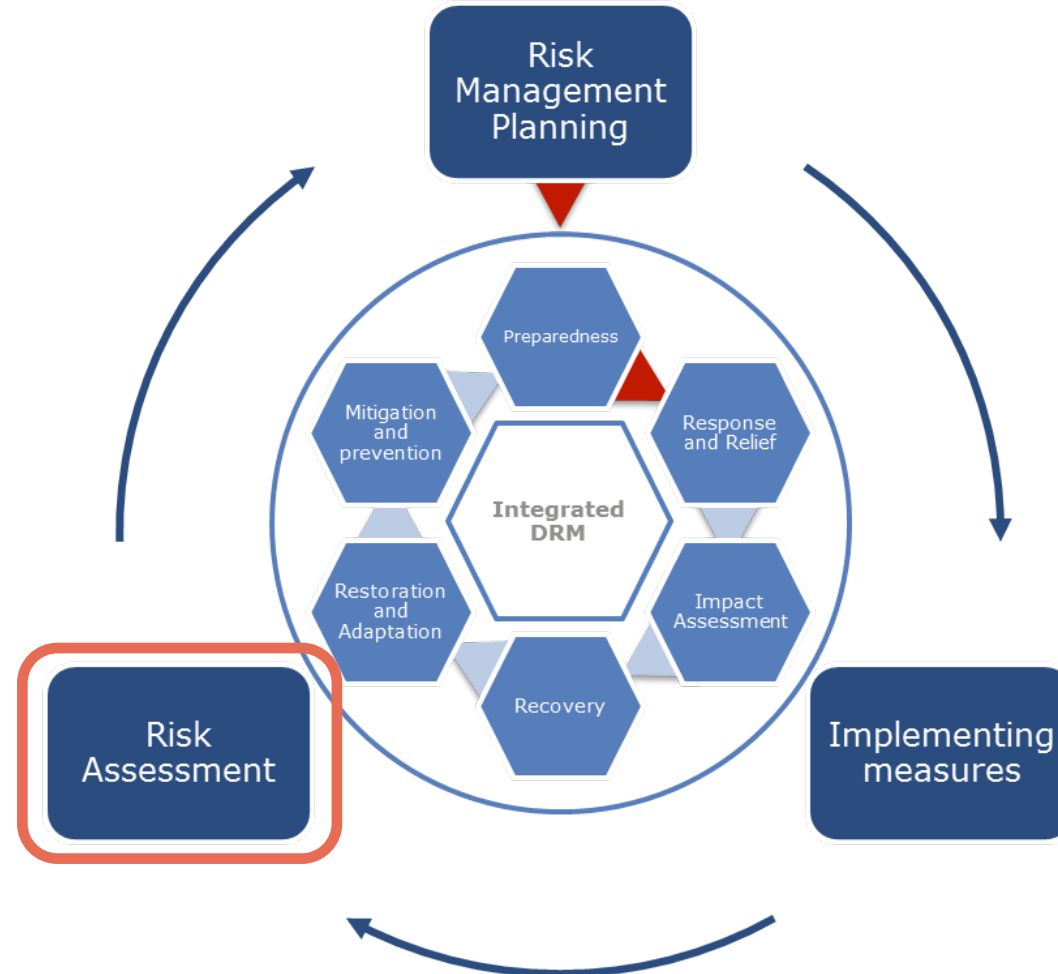


Forest fires in Portugal in 2017

117 fatalities
259 000ha burned
EUR 1.456 billion

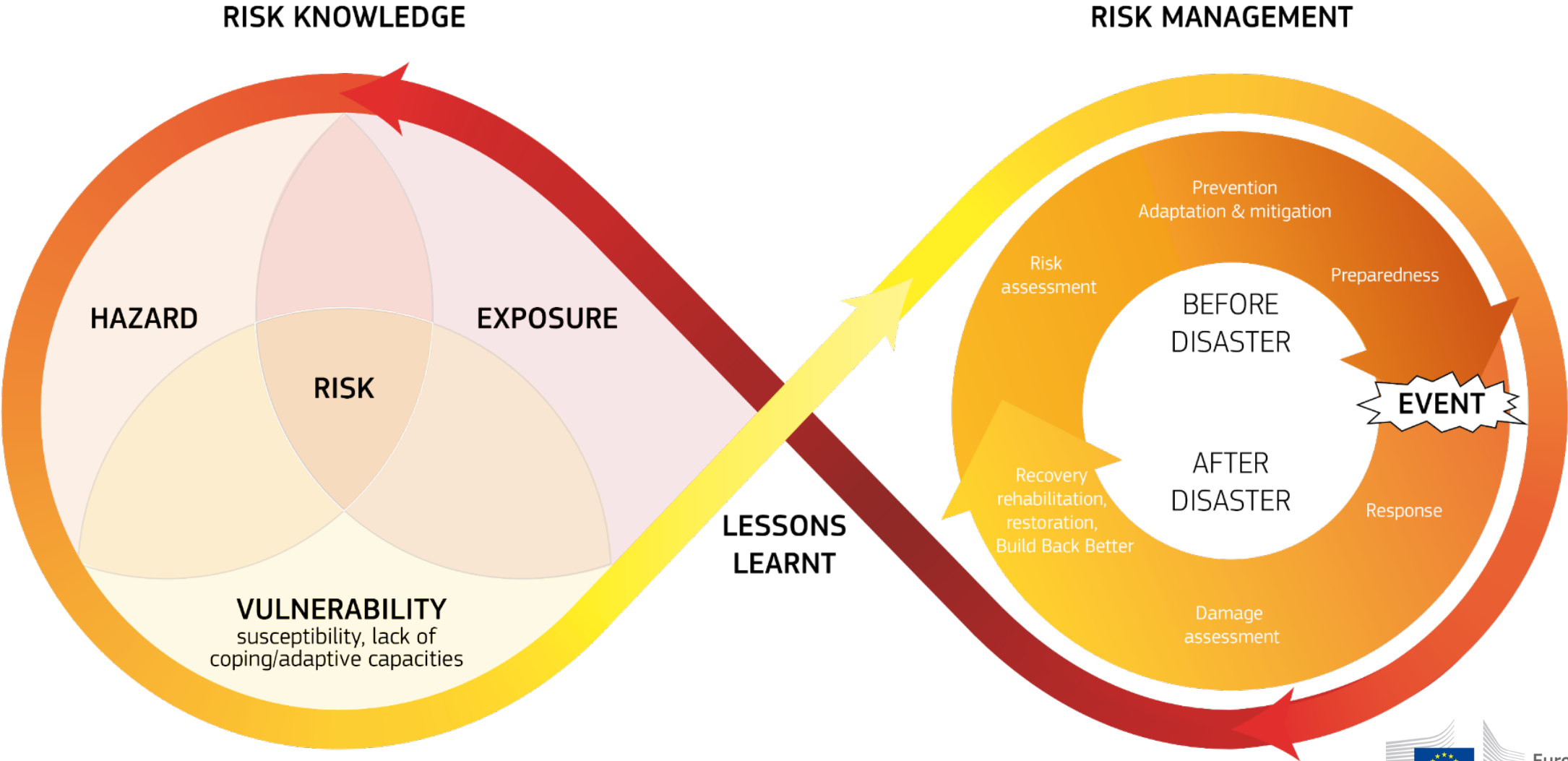
National Risk Assessment is at the heart of the **policy cycle**

National risk Assessment is **providing evidence** for a tough decision making process at the national level with many stakeholders involved



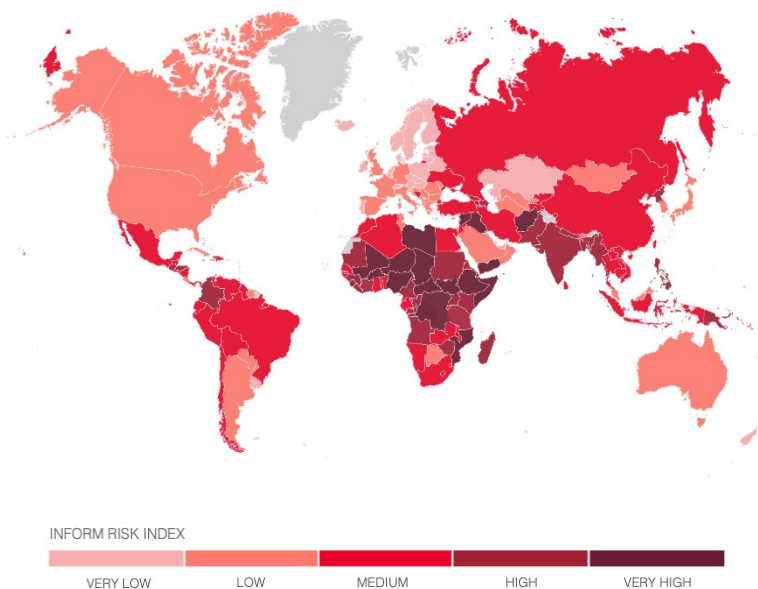
The goal is to implement disaster risk reduction strategies which should result in less disasters and/or disasters with less impacts and increase of overall resilience.

Understanding disaster risk

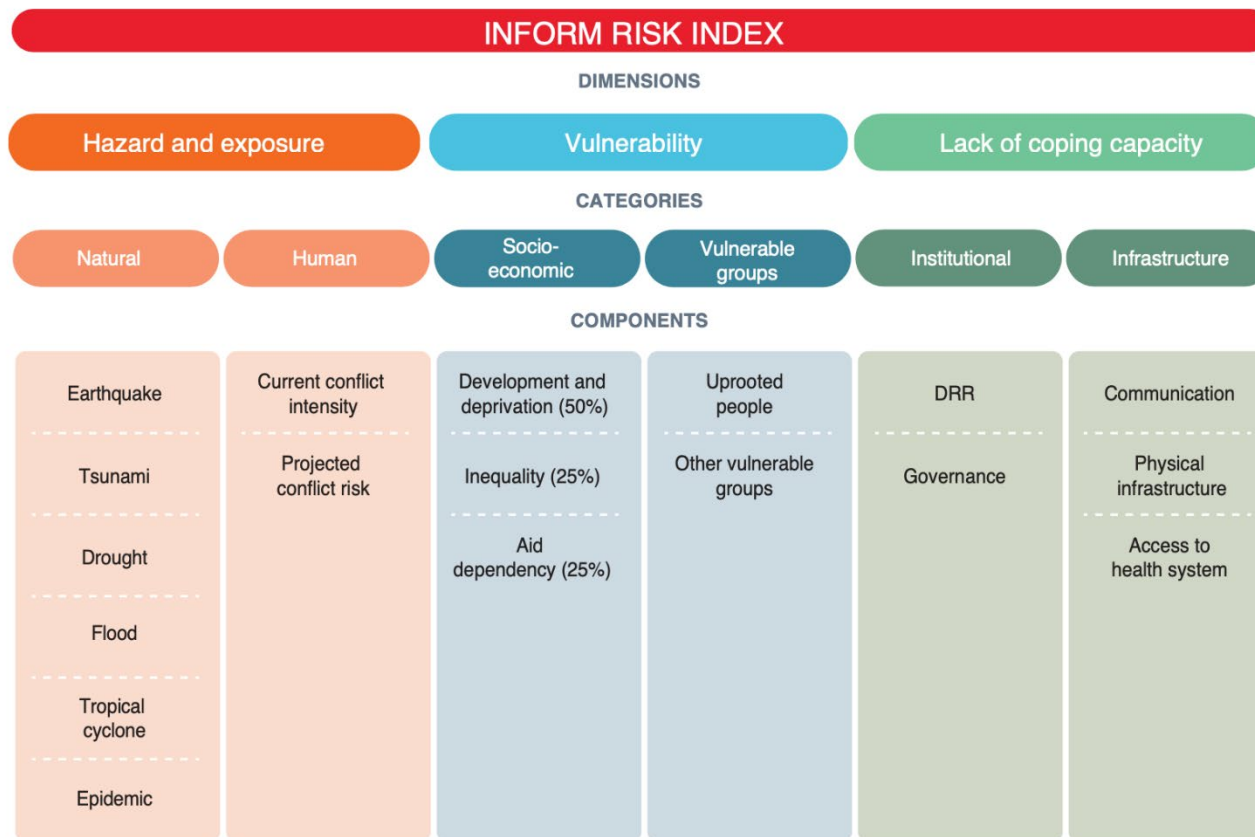


INFORM RISK

Risk of a disaster that exceeds national capacity to respond (next 3-5 years)



Components of risk covered by the INFORM Risk Index



Risk Data Hub main modules

Supporting the EU Climate Change Adaptation Strategy and the EU effort in achieving the priorities of the Sendai Framework for Disaster risk Reduction

Risk Data Hub is a GIS web platform of European wide risk data and methodologies for Disaster Risk Assessment.



Risk Analysis

Risk analysis in Map Viewer



Disaster Loss Data

Impacts from past events in Map Viewer



Facts and Figures

Cross-hazard comparative view of both past and future impacts



DRM Data from other projects

Results of DRM related projects: PESETA IV



Learning Space

Documentation and methodological notes on



User Corner

Restricted area dedicated to authorized user

Facts and Figures: Disaster Loss Data

This module presents figures and charts from the DRMKC RDH losses and damage. Please select an Asset, a Hazard, a metric and the desired level of aggregation. For a smoother experience it is advisable to select NUTS-2 and NUTS-3 just for a subset of countries (filter column below this textbox). For convenience, users are able to filter the visualization by years and countries.

Countries

- Andora
- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland

Years

- 2022
- 2021
- 2020
- 2019
- 2018
- 2017
- 2016

Asset

Population

Hazard

Windstorm

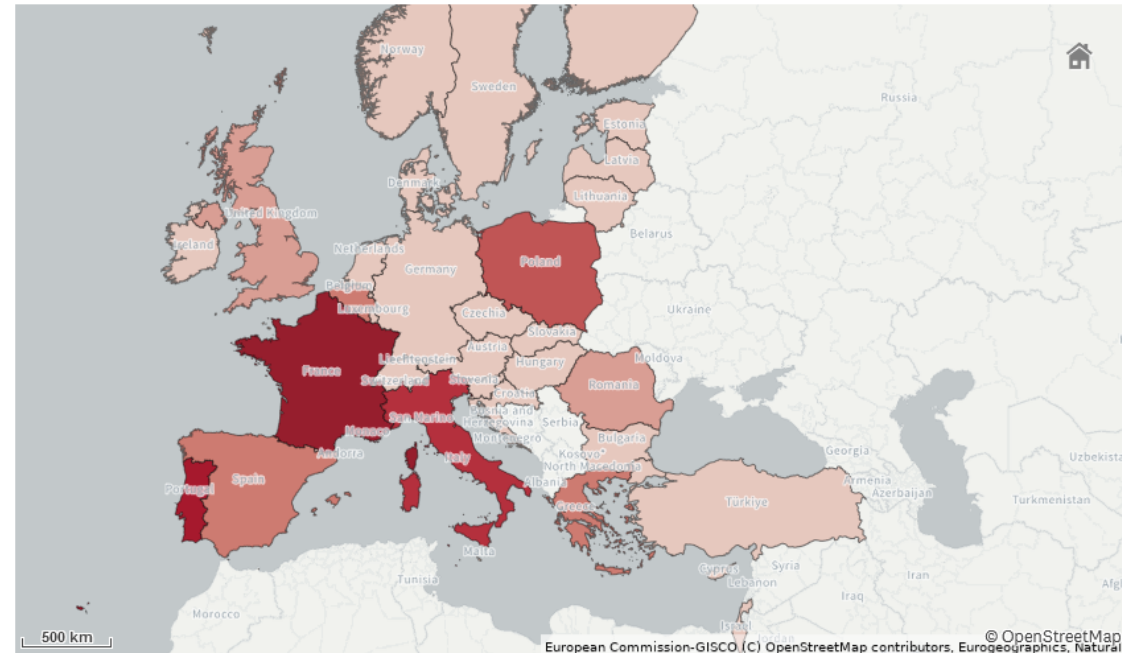
Aggregation

Country

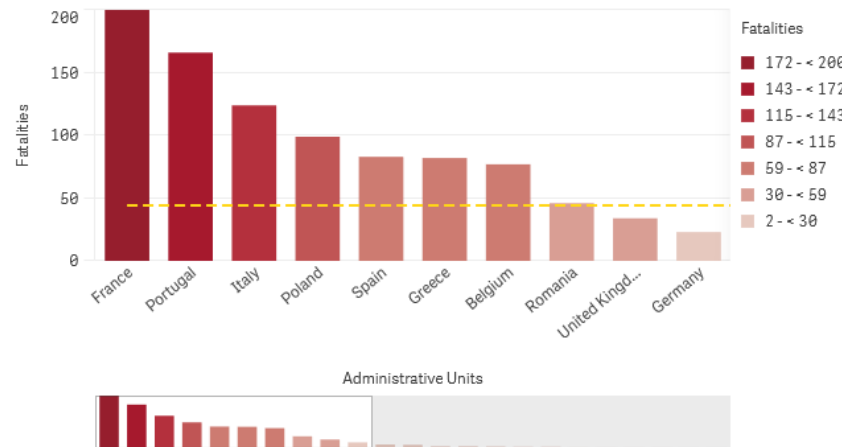
Metric

Fatalities

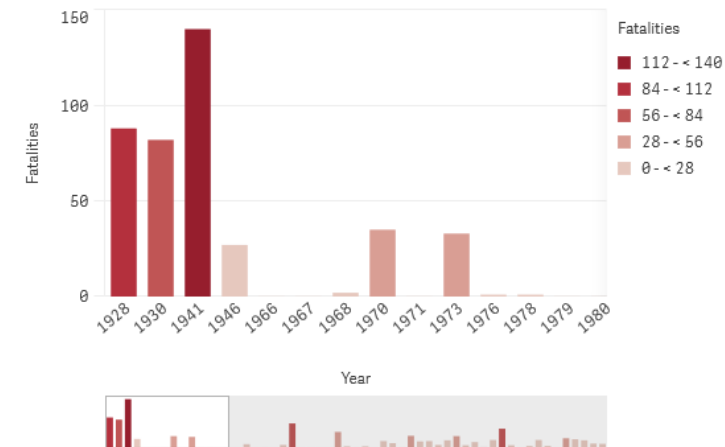
Map of Losses (Windstorm)



Total Losses (Windstorm) - Rank by Administrative Units



Total Losses (Windstorm) per Year



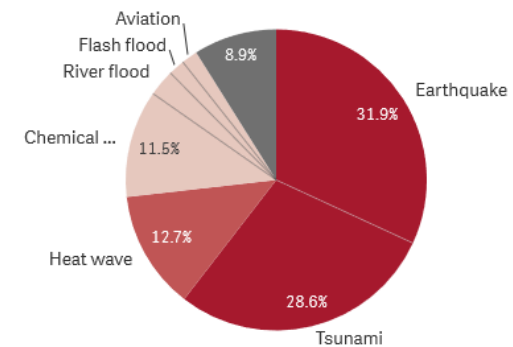
Metadata

Data Table (Windstorm)

Admin Units	Total Losses	No. Impacts Recorded
Total	1017	901
France	200	104
Portugal	166	13
Italy	124	38
Poland	99	41
Spain	83	42
Greece	82	8
Belgium	77	20
Romania	46	11
United Kingdom	34	107
Germany	23	75
Ireland	15	92
Hungary	14	7
Czech Republic	8	26
Denmark	8	37
Switzerland	7	40
Slovenia	6	2
Sweden	6	27
Netherlands	5	35

Sharing of Total Losses

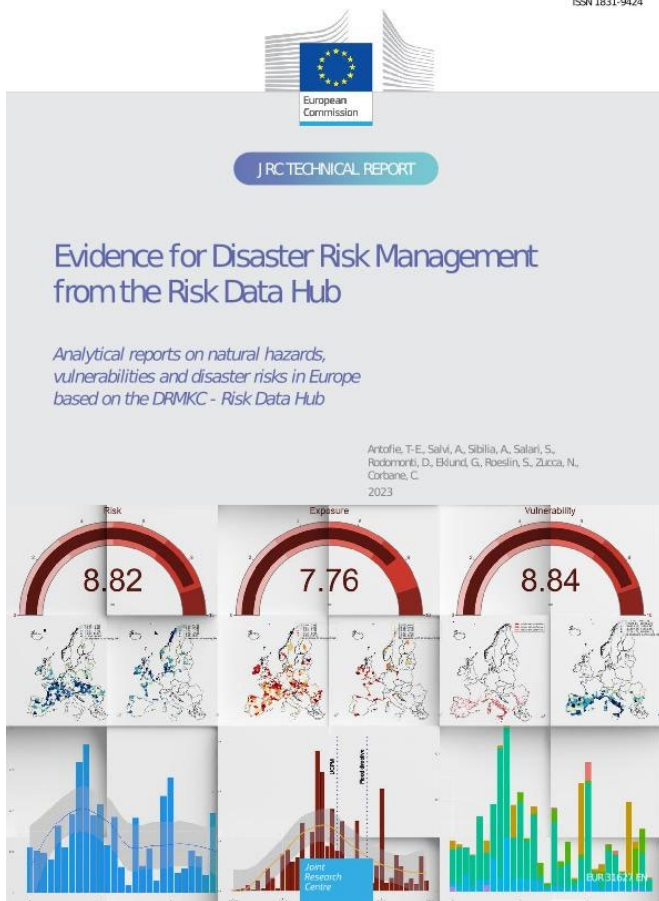
All hazards by selected years & administrative units



Risk Data Hub: Analytical reports

Evidence for Disaster Risk Management from the Risk Data Hub

ISSN 1831-9424



Report: 1. Analysis of European wide losses and risks from single hazards

This analysis of relevant hazards at European level comparing historical damages and losses, and current risk levels.

Report: 2. Identifying European wide regions with multi-hazard potential and quantify their population at risk

Assessment of population at risk from multiple hazards at the level of Local Administrative Units (LAU) and the multi-hazard interactions based on a theoretical framework.

Report: 3. Identifying European regions with Emerging and Increase in risk

Identification of regions with emerging and increase in risk that are the result of low probability hazard occurrence.

Report: 4. Identifying drivers of vulnerability and disaster risk

Trends in terms of disaster vulnerability and its components.

Report: 5. Country Reports

Overview of the risk and its components for a selected country.

Risk Data Hub: vulnerability dashboards



Eklund, G., Sibilia, A., Salvi, A., Salari, S., Rodomonti, D., Poljansek, K., Marzi, S., Gyenes, Z., Corbane, C., Antofie, T-E., *Towards a European wide vulnerability framework*, Publications Office of the European Union, Luxembourg, 2023, doi: [10.2760/353889](https://doi.org/10.2760/353889), [JRC118850](https://doi.org/10.2760/353889)

Eklund, G., Sibilia A., Salvi A., Antofie T-E., Rodomonti D., Salari S., Corbane C., Pal J., Melchiorri M., *Vulnerability to Disasters in Europe*, Disaster Risk Management Knowledge Centre, European Commission, 2022, <https://drm.kc.jrc.ec.europa.eu/risk-data-hub/#/vulnerability-in-europe>



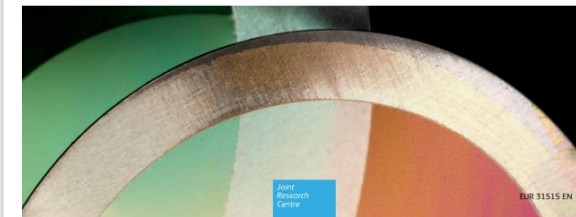
JRC TECHNICAL REPORT

Towards a European wide vulnerability framework

A flexible approach for vulnerability assessment using composite indicators

Eklund, G., Sibilia, A., Salvi, A., Antofie, T-E., Rodomonti, D., Salari, S., Poljansek, K., Marzi, S., Gyenes, Z., Corbane, C.

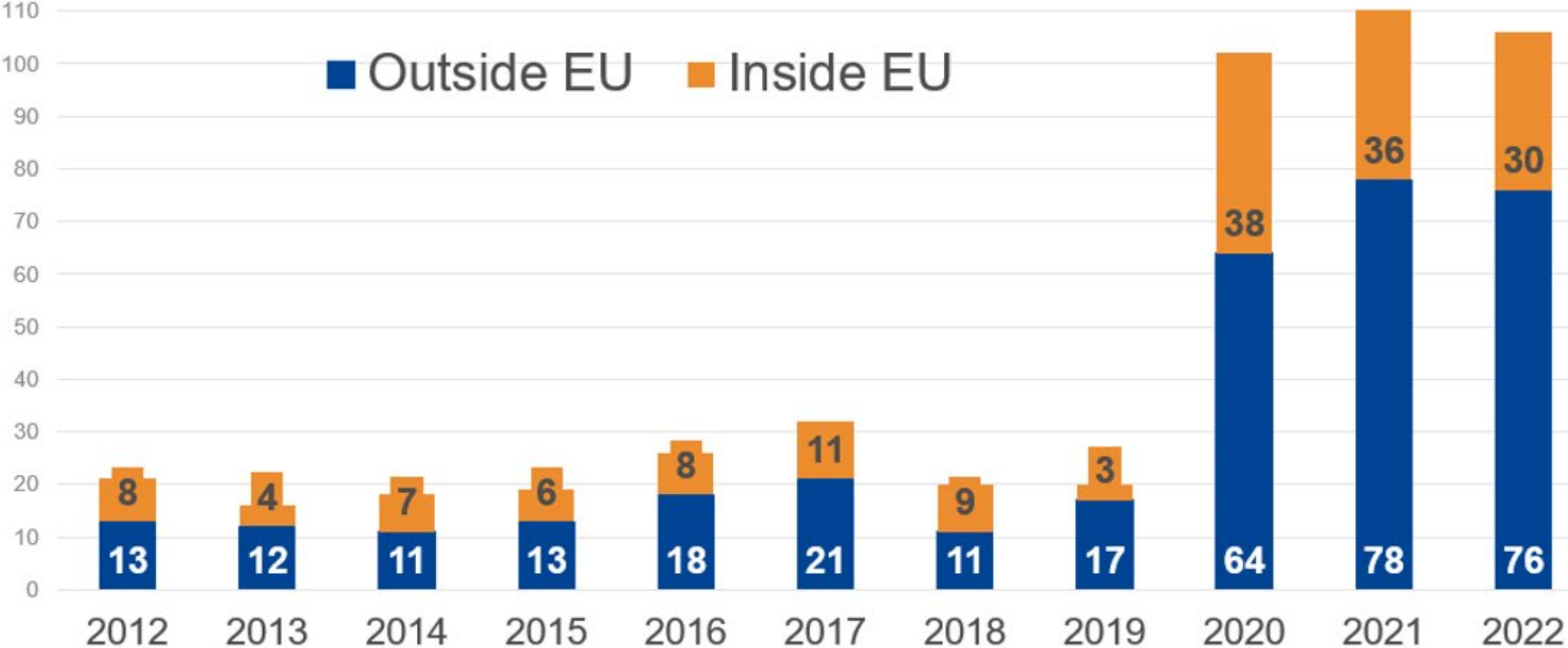
2023



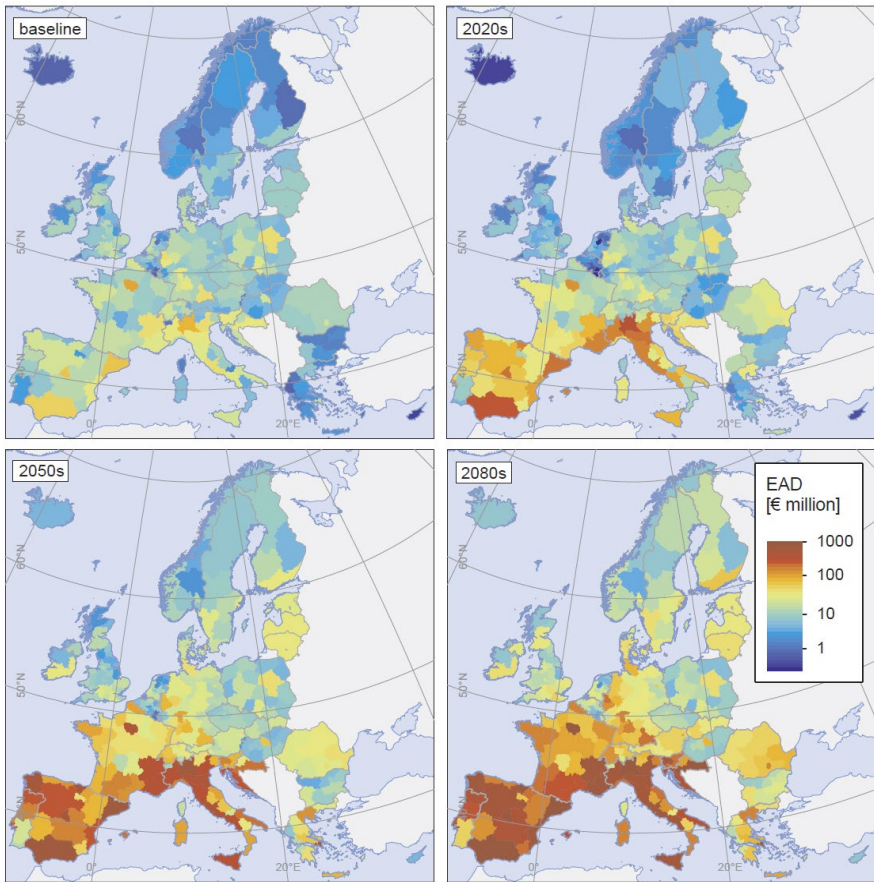


The Evolving Disaster Risk Landscape

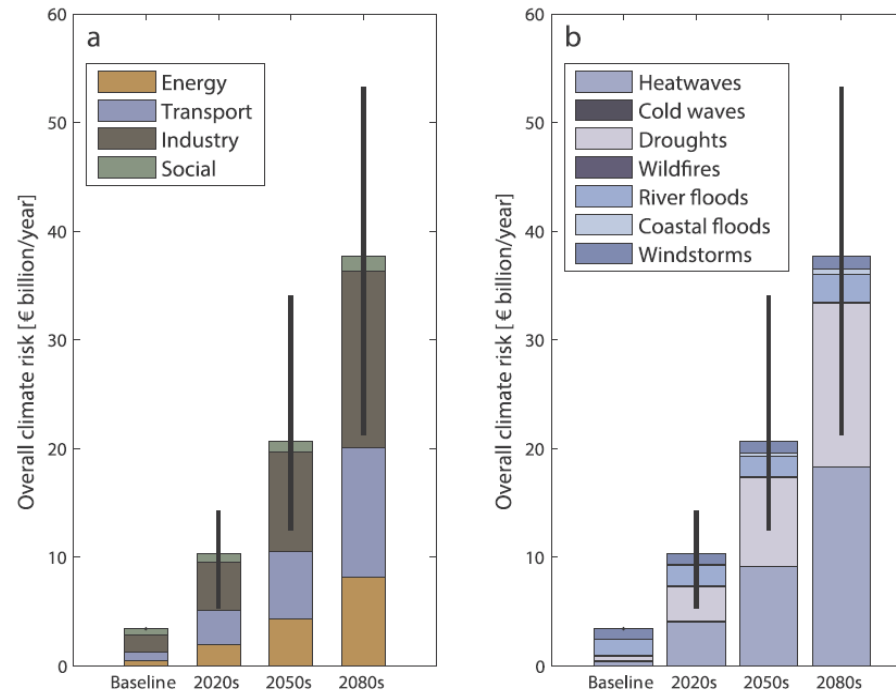
Increasing requests for emergency assistance from the EU Civil Protection Mechanism



Risk is increasing and unequal under climate

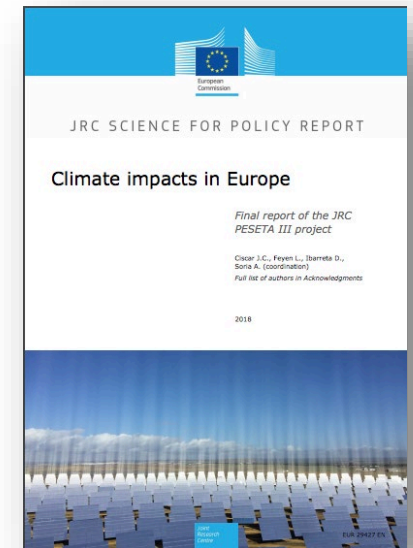


Spatial distribution of climate risk for critical infrastructure in Europe in 21^o century



Evolution of damage from climate impacts on critical infrastructure in 21^o century

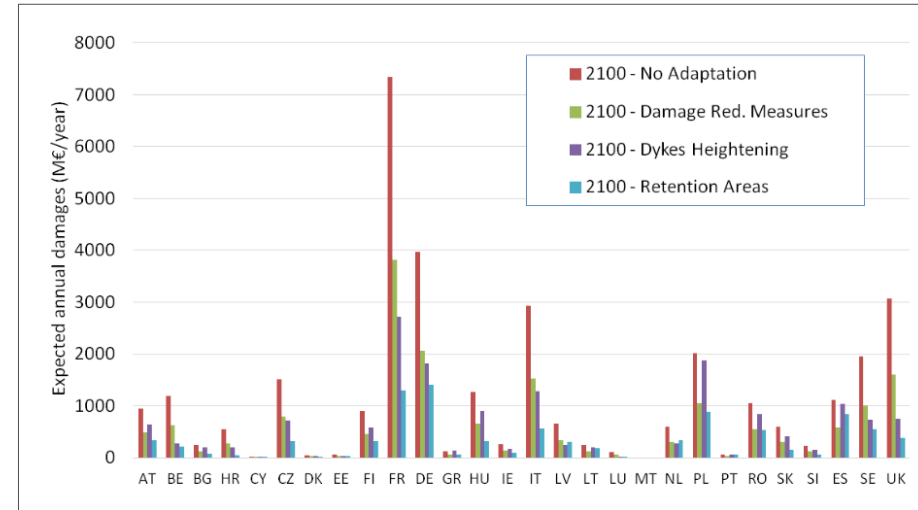
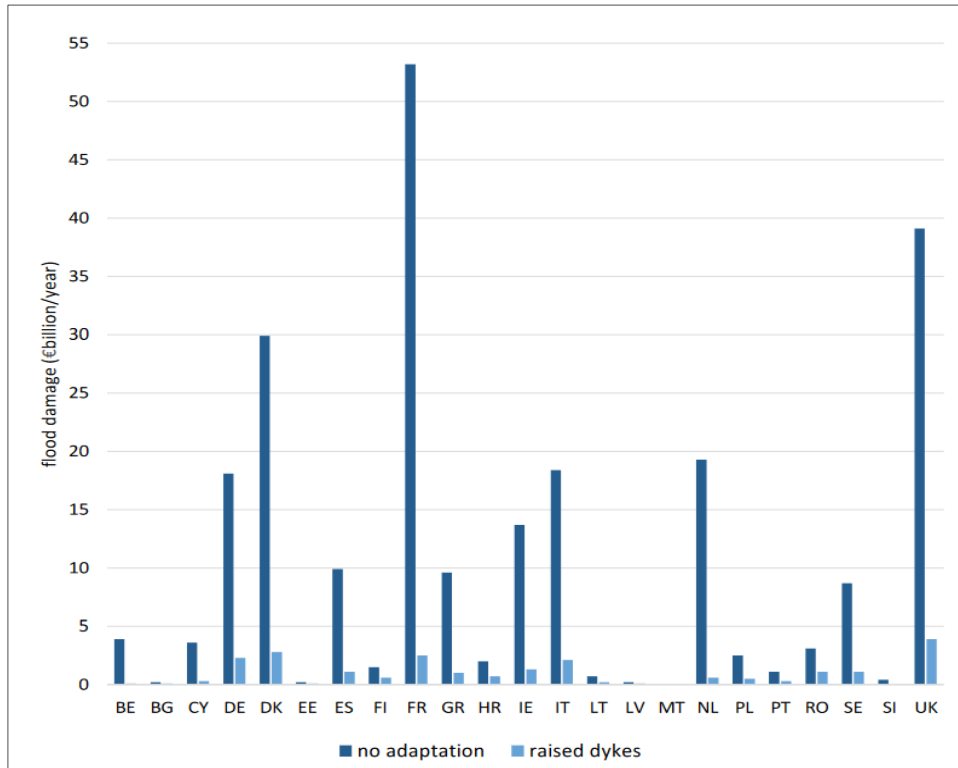
Increasing damage of climate related disasters on **critical infrastructures** in Europe with global warming.



Forzieri et al., *Global Environmental Change*, 2018

Climate change as driver of disaster risk

Flood risk



↑ Comparison of expected annual damage in 2100 (2°C warming) due to river flooding, considering the implementation or not of adaptation measures (PESETA IV, 2020).

← National annual damage without and with adaptation by 2100 (high emissions scenario) due to coastal flooding (PESETA IV, 2020).

PESETA IV Report:
https://ec.europa.eu/jrc/sites/default/files/pesetaiv_summary_final_report.pdf

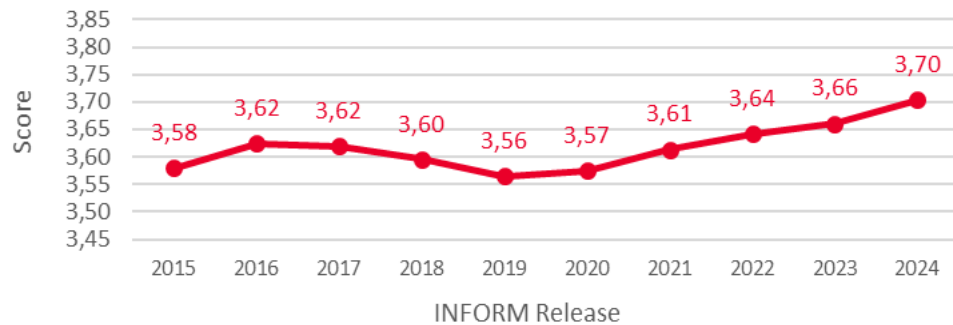
- New releases : data and information systems

INFORM Risk 2024

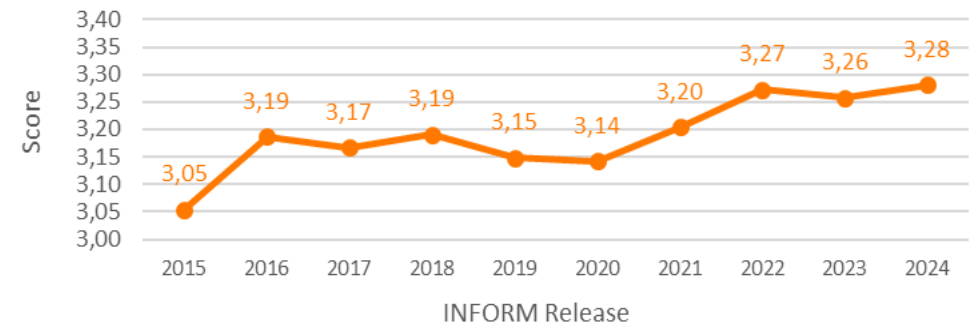
A decade of INFORM Risk

Global trends in the INFORM Risk Index and its dimensions 2015-2024

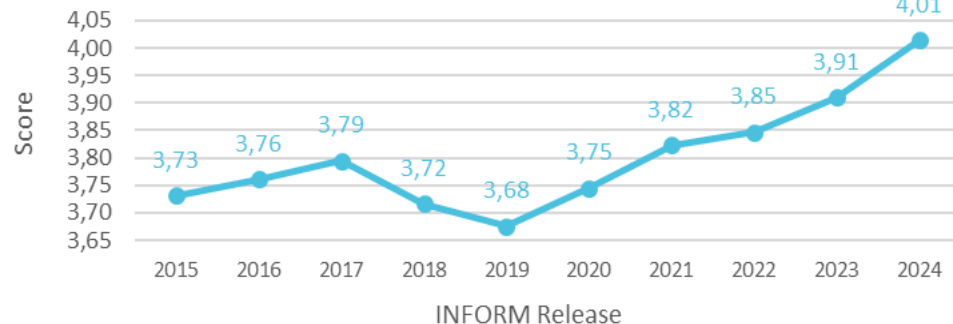
INFORM Risk Index Average Trend



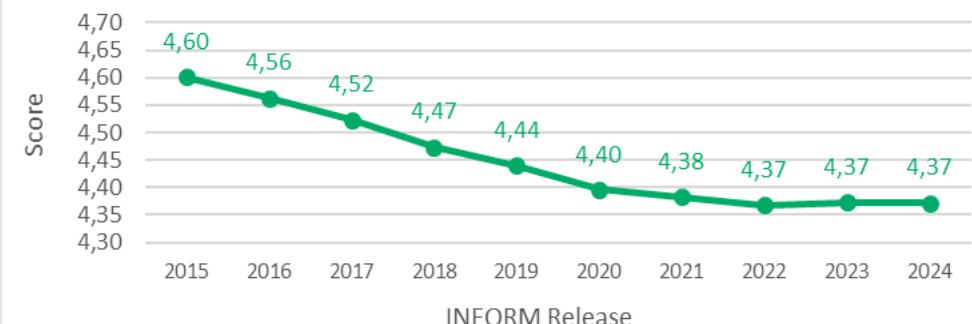
Hazard&Exposure Index Average Trend



Vulnerability Index Average Trend



Lack of Coping Capacity Index Average Trend



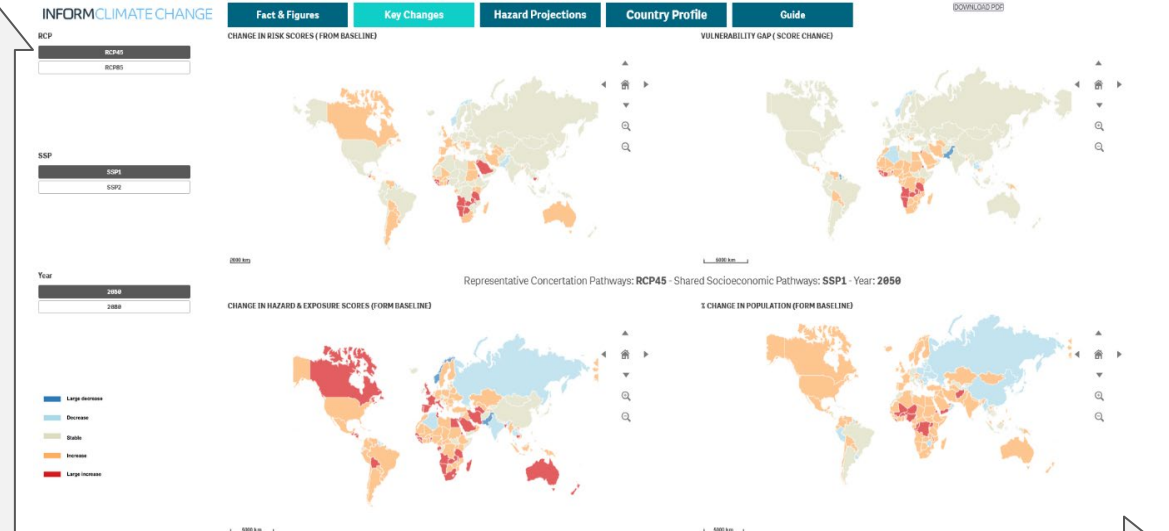
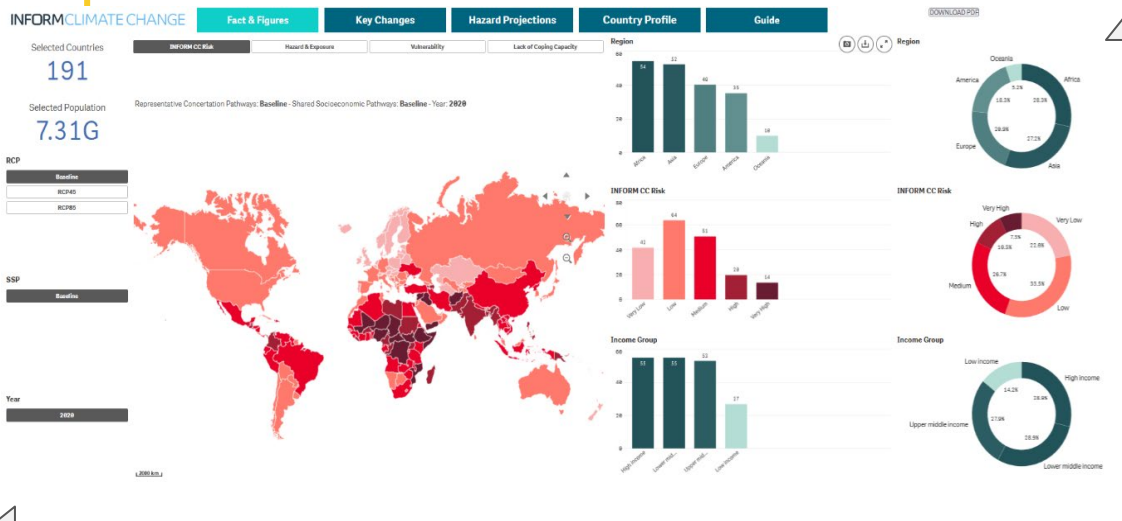


Identifying opportunities for future sustainable development

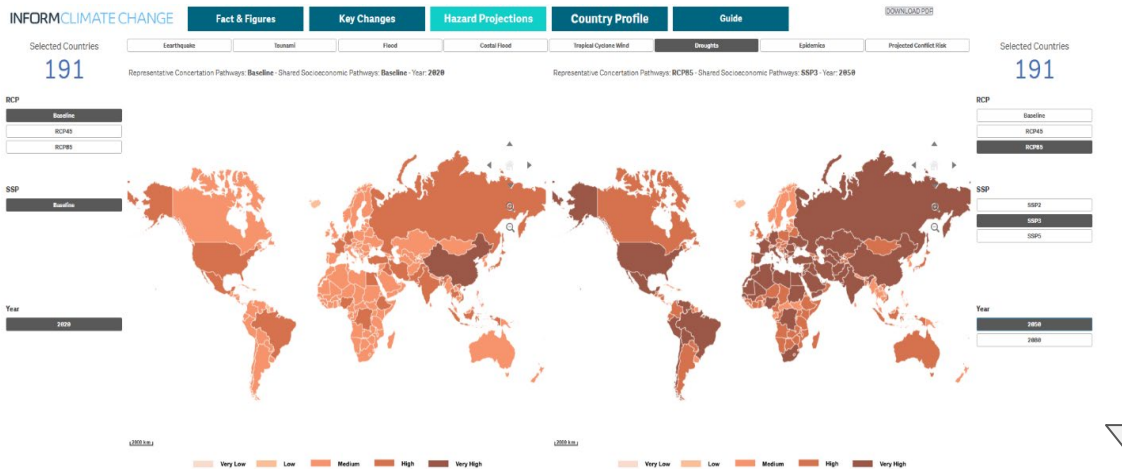
INFORM CLIMATE CHANGE TOOL



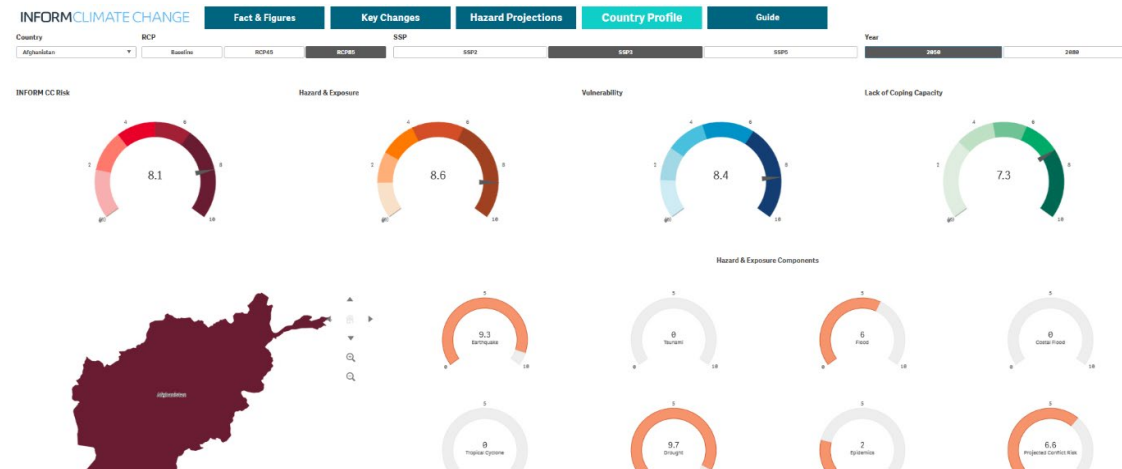
Key changes



Hazard projections



Country profile



5 Union disaster resilience goals



Anticipate

Improve risk assessment, anticipation and risk management planning



Prepare

Increase risk awareness and preparedness of the population



Alert

Enhance early warning



Respond

Enhance the Union Civil Protection Mechanism response capacity



Secure

Ensure a robust civil protection system

5 Flagship initiatives

Europe-wide disaster scenarios

'preparEU'
a pan-European awareness raising programme

Linking global early warning with local action in Europe

Scaling-up rescEU strategic reserve

Stress-testing the emergency operation centres across Europe

Goal 1: Anticipate

Improving risk assessment, anticipation and risk management planning

What to do?

Develop EU-wide disaster scenarios

Improve risk assessment

Improve anticipation

Improve planning

Improve the capability of civil protection to develop preventative actions

Flagship 'Europe-wide disaster scenarios'

10 disaster scenarios covering
16 main hazards **by end 2023**

Earthquake	Flood	Heatwave / cold wave	Major storm
Health threats	Tsunami	Volcanic eruption	Wildfire
Blackout and energy disruption	Effects of an armed conflict	Effects of a cybersecurity incident	Effects of a terrorist attack
Industrial emergencies	Marine pollution	Nuclear emergencies	Population displacement in emergencies

Goal 2: Prepare

Increasing risk awareness and preparedness of population

What to do?

Increase the overall level of risk awareness

[By 2030, 90 % well aware of risks in their region]

Improve public **access** to disaster risk information

Increase the awareness and adoption of risk prevention and preparedness **measures**

Enhance the **culture** of risk prevention amongst the population

Goal 3: Alert

Enhancing early warning

What
to do?

Improve
forecasting, detection and
monitoring

Improve public warning

Flagship

Linking global early warning
to local action in Europe

Technical and financial
assistance to EU Member
States to identify gaps and
build capacities of national
early warning systems

Goal 4: Respond

Enhancing response capacity of EU Civil Protection Mechanism

Enhance EU capacity to respond

Wildfires

Floods

Search and Rescue needs

Chemical, biological,
radiological and nuclear
events

Health emergencies

Flagship

Double EU's firefighting fleet
by 2024



Goal 5: Secure

Ensuring a robust civil protection system

Enhance

Business continuity of emergency operation centres

Cross-sectoral coordination

Cross-border coordination

Communication and information management

Post-response evaluation (lessons learnt)

Flagship
Stress-test
emergency operation
centres across

