Climate Change Adaptation and Disaster Risk Reduction – the role of risk data

Based on the EEA report on enhancing coherence between Climate change Adaptation and Disaster Risk Reduction

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(Air and climate change programme - EEA)
EEA networking with member countries (Eionet)

- **33 member** and six collaborating **countries** (ministries and **environment agencies**)
- Main target audience: policymakers at European and national levels
- Supporting and informing policy development and implementation by **data, indicators and assessments**
- **Networking:** annual Eionet workshop, expert meetings
- Supported by **European Topic Centres**, e.g. on adaptation see: [http://cca.eionet.europa.eu/](http://cca.eionet.europa.eu/)
2017-2020: EEA content priorities

- Circular economy
- **Climate and Energy**
- Sustainable Development Goals
- Natural Capital
- Copernicus
  - land monitoring service and in-situ coordination
  - climate change service (important European user)
- State of Environment Report (SOER 2020)
Climate change impacts and adaptation products in 2016 and 2017

- Climate change impacts indicators

- Climate change impacts and vulnerability report in Europe, 2016 report

- Climate – ADAPT

- Urban adaptation to climate change, 2016 report and Financing urban adaptation to climate change, 2017 report

- Climate change adaptation and disaster risk reduction – Enhancing coherence of the knowledge base and policies 2017 report (under preparation)
Climate change impacts report – Jan 2017

Arctic region
Temperature rise much larger than global average
Decrease in Arctic sea ice coverage
Decrease in Greenland ice sheet
Decrease in permafrost areas
Increasing risk of biodiversity loss
Some new opportunities for the exploitation of natural resources and for sea transportation
Risks to the livelihoods of indigenous peoples

Atlantic region
Increase in heavy precipitation events
Increase in river flow
Increasing risk of river and coastal flooding
Increasing damage risk from winter storms
Decrease in energy demand for heating
Increase in multiple climatic hazards

Mountain regions
Temperature rise larger than European average
Decrease in glacier extent and volume
Upward shift of plant and animal species
High risk of species extinctions
Increasing risk of forest pests
Increasing risk from rock falls and landslides
Changes in hydropower potential
Decrease in ski tourism

Coastal zones and regional seas
Sea level rise
Increase in sea surface temperatures
Increase in ocean acidity
Northward migration of marine species
Risks and some opportunities for fisheries
Changes in phytoplankton communities
Increasing number of marine dead zones
Increasing risk of water-borne diseases

Boreal region
Increase in heavy precipitation events
Decrease in snow, lake and river ice cover
Increase in precipitation and river flows
Increasing potential for forest growth and increasing risk of forest pests
Increasing damage risk from winter storms
Increase in crop yields
Decrease in energy demand for heating
Increase in hydropower potential
Increase in summer tourism

Continental region
Increase in heat extremes
Decrease in summer precipitation
Increasing risk of river floods
Increasing risk of forest fires
Decrease in economic value of forests
Increase in energy demand for cooling

Mediterranean region
Large increase in heat extremes
Decrease in precipitation and river flow
Increasing risk of droughts
Increasing risk of biodiversity loss
Increasing risk of forest fires
Increased competition between different water users
Increasing water demand for agriculture
Decrease in crop yields
Increasing risks for livestock production
Increase in mortality from heat waves
Expansion of habitats for southern disease vectors
Decreasing potential for energy production
Increase in energy demand for cooling
Decrease in summer tourism and potential increase in other seasons
Increase in multiple climatic hazards
Most economic sectors negatively affected
High vulnerability to spillover effects of climate change from outside Europe
Climate change adaptation and disaster risk reduction – the structure of the 2017 report

Presenting Policies and practices at Global, European and national scales

Weather and Climate related Natural Hazards (10 hazards)

Selected cases of enhance coherence between CCA and DRR

Natural Hazards and Health, Ecosystems, and Economy

Opportunities of enhancing coherence between CCA and DRR

Enhance coherence between CCA and DRR

an 2017 EEA report

8 lead authors, approx. 20 contributing authors
Focus of the report

**Global**
- SDG
- Paris Agreement
- Sendai

**EU**
- The European Union Civil Protection Mechanism
- The EU Climate Adaptation Strategy
- The European Council’s Directive on European Critical Infrastructures
- EU Action Plan on SFDRR 2015-2030
- Climate change adaptation platform in Europe Climate - ADAPT
- The Disaster Risk management Knowledge Centre

**National**
- National and regional policies on climate adaptation and managing disaster risks
Key definitions of CCA and DRR

- **Climate change adaptation** is the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.


- **Disaster Risk Reduction** is the process of preventing new and reduce existing risks. It also focuses on improving resilience, all of which contributes to strengthening resilience and therefore to the achievement of sustainable development.

  *(UNISDR, 2016), Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction*
IPCC (2014), IPCC - SREX (2012)
Changes in weather and climate related natural hazards

- Heat waves
- Heavy rain
- Droughts
- Hail
- Wind storms
- River flows
Changes in climate related natural hazards in bio-geographical regions

- Increase in wind storms and heavy precipitation
- Increase storm surges in coastal zones
- Increase in heat waves
- Increase in drought extremes
- Increase in risk of floods and landslides
- Increase in risk of hail events
- Increase in Mediterranean storms (Medicanes)
- Increase in forest fires
- Increase in flash floods
- Increase in heavy precipitation
Deaths due to flooding

Data on number of deaths received from WHO, population data by EUROSTAT

Cumulative number of deaths due to river floods in Europe

Deaths per million inhabitants related to flooding in Europe for the period 1991-2015

Rate per 1 000,000 inhabitant
- 0 or not reported
- 0.1-1
- 1-2
- 2-5
- 5-10
- > 10
- Outside coverage

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Losses from extreme events

Recorded losses from Natural hazards per year

- EUR 7.5 billion in the period 1980-1989
- EUR 13.5 billion in the period 1990-1999
- EUR 14.3 billion in the period 2000-2009
- EUR 13.3 billion in the period 2010-2015

~ 30% insured

Meteorological = storms, hail
Hydrological = floods, mass movements
Climatological = heat waves, cold spells, droughts, forest fires
Geophysical = earthquakes, tsunamis, volcanic eruption

Data from Munich RE NatCatSERVICE received under institutional agreement.
Distribution of economic losses

Total amount in 2015 value

Per capita

Per km2

data from Munich RE NatCatSERVICE received under institutional agreement.
Cumulative losses 1980-2015

Total economic losses in 2015 prices
- Total losses: €433,094 million Eur
- 22.6%
- 38.9%
- 38.6%

Insured losses in 2015 prices
- Insured: 35%
- 27.7%
- 64.6%

Fatalities in the period 1980-2015
- Fatalities: 89,873
- 4.4%
- 4.7%
- 90.9%

Data from Munich RE NatCatSERVICE received under institutional agreement.
Conclusions

• Weather and climate related natural hazards as heat waves and heavy precipitation are **becoming more frequent and/or intense** in Europe, and along with socio-economic changes and hazard exposure.

• **The total reported economic losses** caused by extreme weather and climate-related events in the EEA member countries over the period 1980-2015 amount to around **EUR 433 billion**. A large share of the total losses (70%) has been caused by a small number of events (3%).

• Successful coherence in knowledge base, policies and measures of CCA and DRR reduces duplication of efforts and contributing to **better preparedness** and response to disasters.

• **Comprehensive**, multi-hazard risk and vulnerability assessment frameworks are needed to **inform evidence-based and robust decision making** in disaster risk reduction and climate adaptation.
• Hazard mapping and risk assessment (like risk of flooding) is an area where integration of DRR and CCA is well advanced and recognised as a priority area. Yet there is still a scope for improving coherence between climate change impacts and vulnerability (CC IV) assessments, and the assessments of disaster risk.

• Examples from different countries show that coherence between CCA and DRR is already in practice, however mostly at local level.