



Reinforcing civil protection capabilities into
multi-hazard risk assessment under climate change



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European Union
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Needs of civil protection and emergency management

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Objectives

Identify gaps and operational data requirements to be considered during risk assessment and planning process

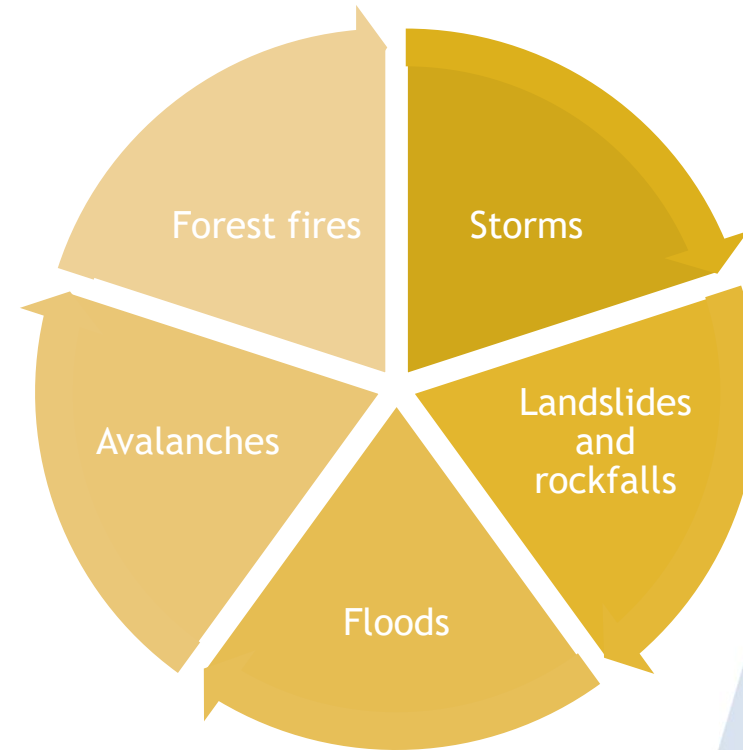
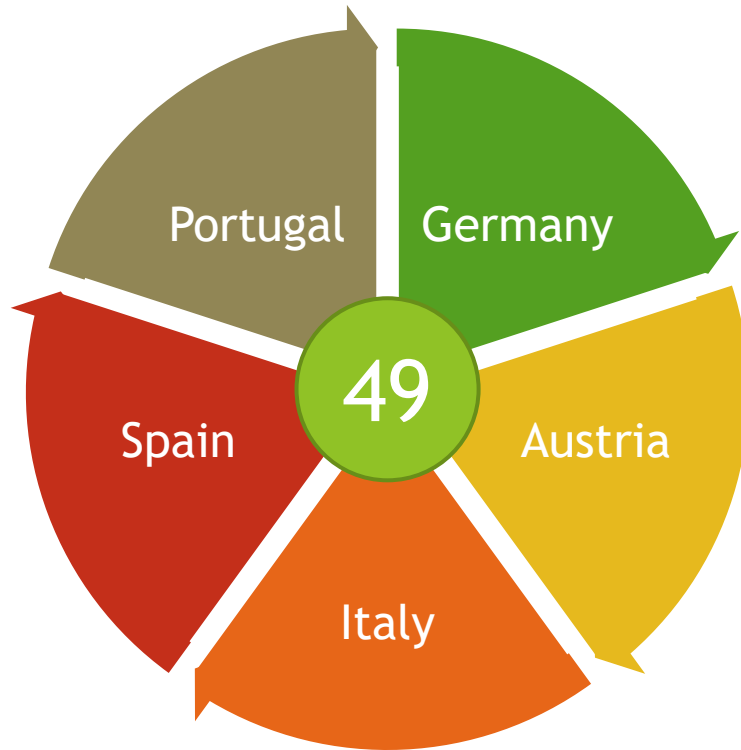
Enhance civil protection capabilities in an integrated prevention-preparedness-response approach and cost-efficient risk management.



Methodology

- ▶ Interviews to civil protection and emergency management experts conducted by each partner
- ▶ Summary and sorting by cross-sectoral components of risk management and by risk

Interviews



Interviews

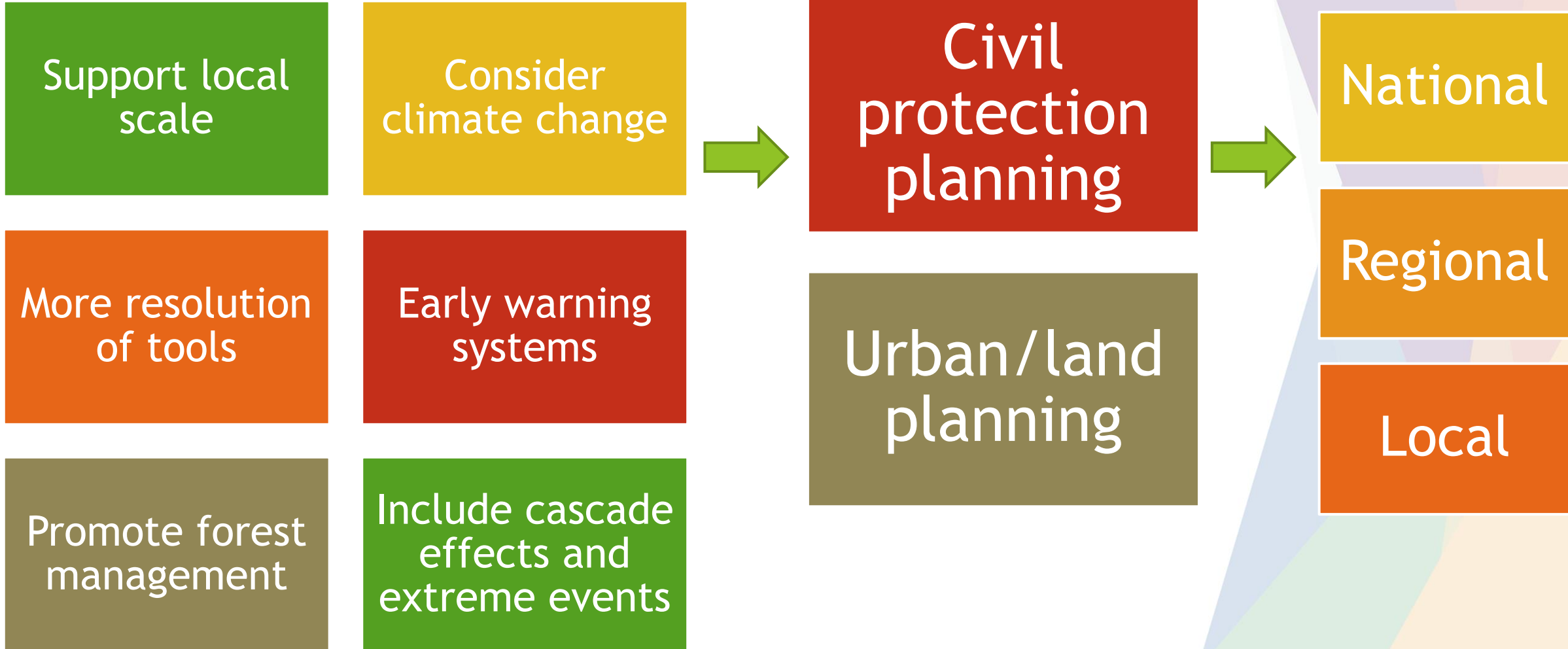


Risk governance and policy





Risk assessment, mapping, and planning tools



Emergency management and response capacity

Practical
training and
drills

Data exchange

Efficiency in
communication
processes

Written cost-
efficiency
criteria

Tools for a global
knowledge of
the event
evolution

Coordination and
cooperation

Standard
procedures and
efficiency in
decision making

Overload - more
staff and
resources

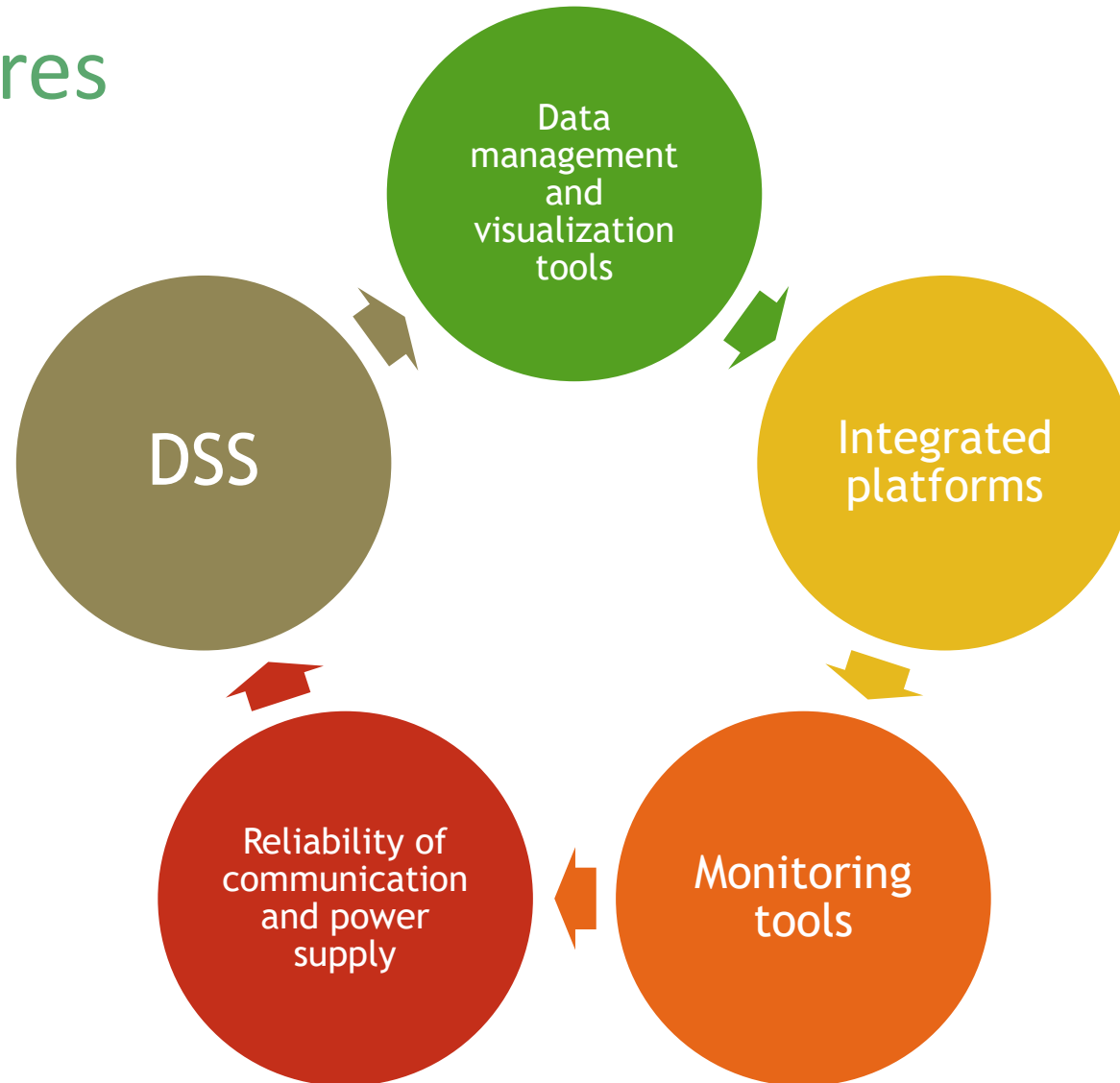
Clear
responsibilities



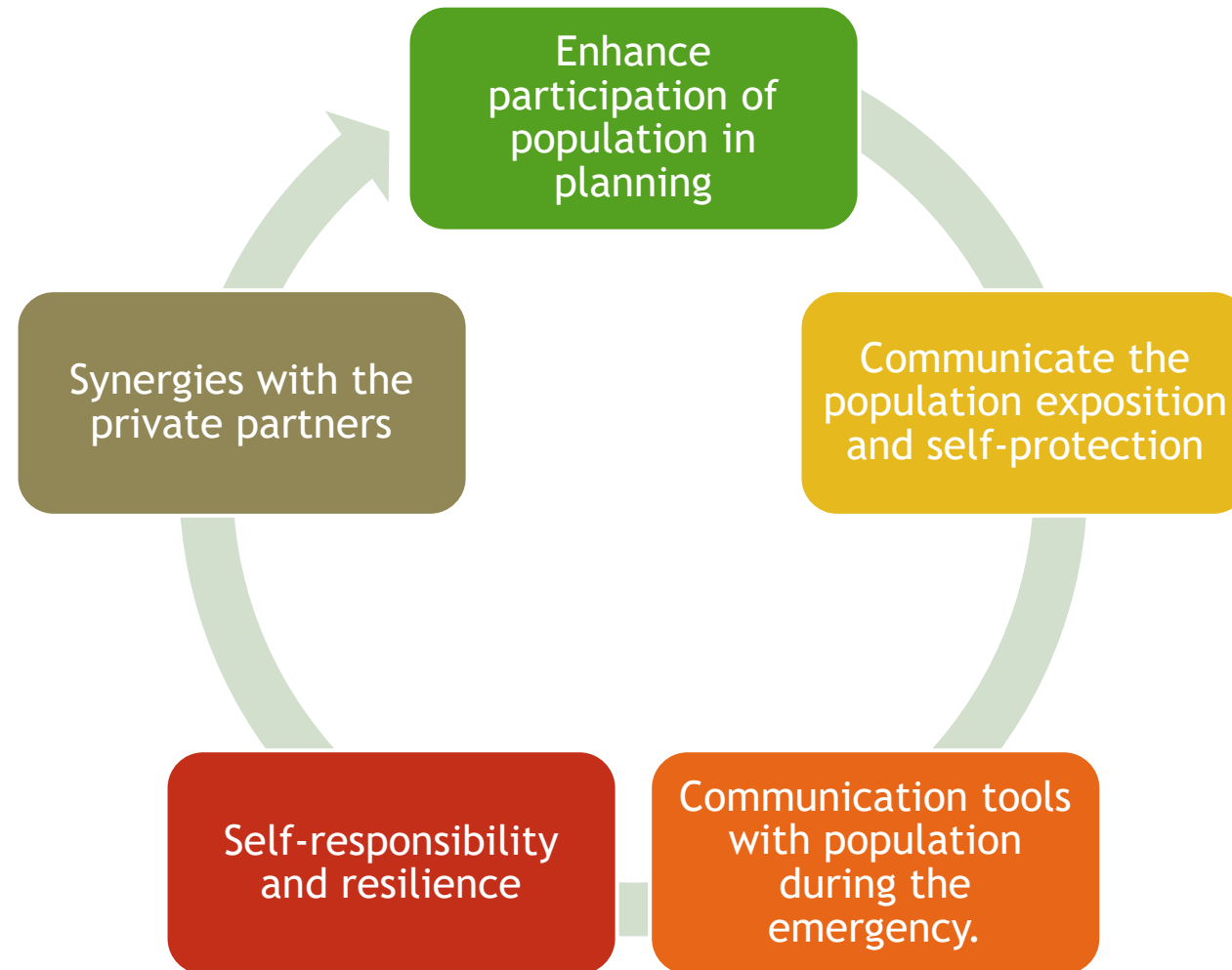
**Faster
reaction**

**More
efficiency**

Technical measures



Risk culture and communication





Recovery





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Farther details [here](#):



RECIPE REINFORCING CIVIL PROTECTION
CAPABILITIES INTO MULTI-HAZARD
RISK ASSESSMENT UNDER
CLIMATE CHANGE

Our sincere gratitude
to all those who was
interviewed

Report on Civil Protection and
emergency management
requirements to face natural hazards





RECIFE

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Climate Change impacts on hazards and risk management

WP 3

CTFC



PAU
COSTA
FOUNDATION

protecció civil



Forest Research Institute
Baden-Württemberg

cimc
OBSERVE TO PREDICT

BFW
Austrian Research Centre for Forests



INSTITUTO
SUPERIOR DE
AGRONOMIA
Universidade de Lisboa



ICGC
Institut
Cartogràfic i Geològic
de Catalunya



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Topics

- ▶ Climate Change impacts on natural hazard and risk management **_from documentary review**
- ▶ Requirements of Civil protection and risk managers for facing climate change impacts **_from interviews**
- ▶ Integration of climate change scenarios into multi-hazard risk assessment and planning

Climate Change impacts on natural hazards: documentary review



Wildfires: global average temperatures and droughts are expected to increase. The **intensity and frequency of wildfires will therefore increase.** The number of annual fire risk days and the potential of extreme wildfire events increase.



Floods (flash floods): increase in the **occurrence and intensity** of floods in Europe.



Landslides: the expected increase in torrential rainfall may lead to a higher frequency of landslides



Avalanches: increase in the **frequency and magnitude** of wet snow avalanche situations.



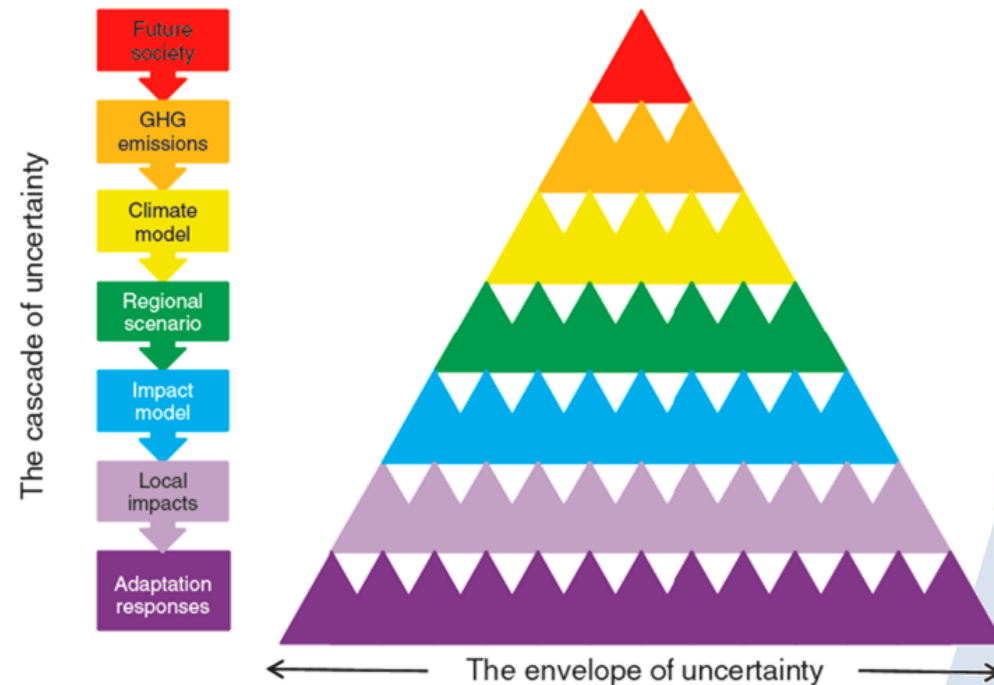
Rockfalls: degradation of permafrost due to global warming will favour an increase in the frequency of rockfall above the permafrost limit.



Storms: increase in the occurrence, duration and intensity of winter storms.

Climate Change impacts on natural hazards: documentary review

- ▶ Climate change models are affected by high level of uncertainty.
- ▶ Climate model output is used as input into impact models and hence the existing uncertainties propagate further.



The cascade of uncertainty from Wilby & Dessai (2010, Weather)



Climate Change impacts on risk management: documentary review

- ▶ DRM actions and policies should be addressed among other by maintaining flexibility, developing improvements even in absence of climate change, and by being able to cope with a range of climate impacts
- ▶ Need for a “new” approach able to address DRM in a climate change context:
 - a **greater collaboration between stakeholders but also a more deepen engagement of the different actors** in DRM and in EWS, including the private sectors and political actors- in the different phases of the DRM cycle;
 - an **integrated and holistic approach of DRM** and a better governance
 - a clearer chain of **responsibility**;
 - new tools for (disaster) risk assessment and planning
- ▶ DRM needs a bigger and consistent financial support. For this reason, many projects work on risk transfer and insurance, in order to strengthen the link between risk transfer and risk reduction.

Requirements of civil protection and risk managers for facing Climate Change



54 Civil Protection (CP) operators interviewed

from different administrative levels and authorities

27 risk managers interviewed

from different administrative levels and authorities

	#	ADMINISTRATIVE LEVEL	AUTHORITY / PROFILE
Germany (FVA): Storms	4	Local, regional and national	<ul style="list-style-type: none"> German Committee for Disaster Reduction Federal Office of Civil Protection and Disaster Assistance Regional council Freiburg Technical Advisor forest fires Political decision-makers
Austria (BWF): Rockfalls & Landslides	11	Local, regional and national	<ul style="list-style-type: none"> representatives of public authorities, support organizations of the federal states fire brigades and CP and disaster management Mayor and technicians of the Municipalities of 5 Terre
Italy (CIMA): Wildfires	16	Local, regional and national	<ul style="list-style-type: none"> Regional Civil Protection sector (Liguria) Regional Department of agriculture, fire fighting (Liguria) National Civil Protection Department
Italy (CIMA): Floods	15	Local, regional and national	<ul style="list-style-type: none"> Mayor and technicians of the Municipalities of 5 Terre CP sector of Liguria Region National Civil Protection Department
Spain (PCF, DGPC CAT, ICGC, CTFC): Wildfires & Avalanches	8	Regional	<ul style="list-style-type: none"> Catalan Fire and Rescue Service Catalan Civil Protection body
Portugal (ISA): Wildfires	5	Local, regional	Municipal and inter-municipal civil protection offices

	#	ADMINISTRATIVE LEVEL	AUTHORITY / PROFILE
Austria (BWF): Rockfalls & Landslides	11	Local, regional and national	<ul style="list-style-type: none"> Political decision-makers representatives of public authorities, support organizations of the federal states fire brigades and CP and disaster management
Italy (CIMA): Wildfires	1	Regional	Regional department of agriculture, tourism, training and work policies in the internal areas, forest fire fighting, foresting, parks and biodiversity
Italy (CIMA): Floods	1	Sub-national	River Basin District authority
Spain (PCF, DGPC CAT, ICGC, CTFC): Wildfires & Avalanches	10	Regional	Cartographic and Geological Institute of Catalonia (ICGC), Catalan Water Agency (ACA, in Catalan), Urban agenda and Territory Secretariat, General Directorate of Rural Agents, Forest fire prevention section of the Agriculture Department, Catalan Meteorological Service.
Portugal (ISA): Wildfires	4	Local	Technicians working in municipalities from North to South of Portugal, in the littoral and mountainous areas

Requirements of civil protection and risk managers for facing CC

Needs/Priorities of civil protection operators

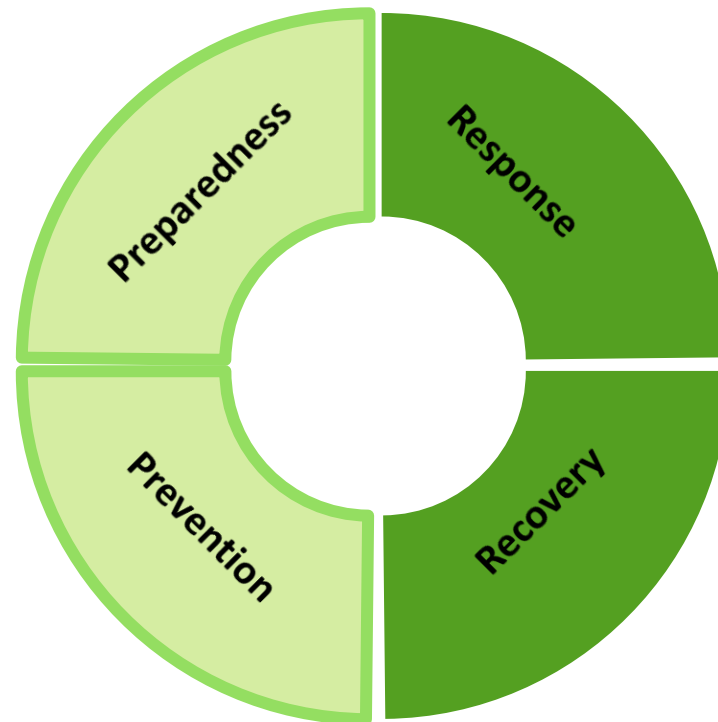
- **to strengthen the collaboration** between institutions at different levels but also between offices of the same agency (not only during an emergency but in all the phases of the risk management cycle)
- **to gain knowledge of climate change scenarios and uncertainties**
- **to improve the forecasting and monitoring** (capacities and systems), so improving **early warning system**
- **to get new real-time tools** to manage an emergency and to support decisions (including monitoring tools)
- **to rise risk awareness of communities** also by involving the population and reinforcing communication

Needs/Priorities of risk managers

- **to reinforce the collaboration and cooperation between institutions** and to **innovate the approach of risk management** from “protect all” to “live with”
- **to better understand new risk scenarios** and to **integrate CC impact** in risk analysis and mapping
- **to integrate territorial, urban planning, forest and agricultural policies** in the DRR Framework (included forest protection) and developing legislative measure to facilitate land management.
- **to understand and manage actual exposure and vulnerabilities** and improve **civil protection plans**
- **to reinforce risk awareness and risk perception** and to **involve the population**

Requirements of civil protection and risk managers for facing CC

These needs are referred to all the phases of the risk management cycle, and especially to **prevention and preparedness**, addressing and embracing the concept that by collaborating and working on prevention and preparedness, also the **emergency response could require less efforts and be more cost-efficient.**



Integration of climate change scenarios into multi-hazard risk assessment and planning

Update the single-risk assessment with CC

- All these results have been integrated into a single-risk assessment that include CC impacts on hazards and risk management
- CC impacts on H, E, V
- New or different measures to reduce Risk



Multi-risk assessment with CC (cumulatively over time)

- Storms/Wildfires - Wildfires/Storms
- Wildfires / Floods (flash floods)
- Wildfires / Avalanches
- Wildfires/Landslides
- Wildfires/Rockfalls

- ▶ The risk of wildfires has an effect and **influence** on the other natural hazards, but also other risks (e.g., storms or avalanches) can increase the risk of wildfires.
- ▶ Multi-risk situations imply a response to a previous emergency situation that has affected/**modified the risk** in the territory. Therefore, it creates a new scenario with a more unstable and hazardous terrain where the risk has increased.
- ▶ **The territory affected by an extreme event should be reinforced and protected in order to minimize and reduce the risk of other possible natural hazards.**
- ▶ This reinforcement and protection need to be implemented as quickly as possible through concrete measures that allow to organize the actions on the terrain and the stakeholders involved (development of protocols and measures).



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For detailed results visit

<https://recipe.ctfc.cat/docs/Deliverable%203.1%20CC%20impacts.pdf>

Report on impacts of climate change projections on wildfires, floods, storms, avalanches, rockfalls, landslides and multi-hazard risk management

Thanks to
all the civil protection
operators and risk
managers that have
been involved in the
interviews!