



**RECIFE**

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



Funded by  
European Union  
Humanitarian Aid  
and Civil Protection

# Climate Change impacts on hazards and risk management

Dissemination event 23/11/2021



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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.



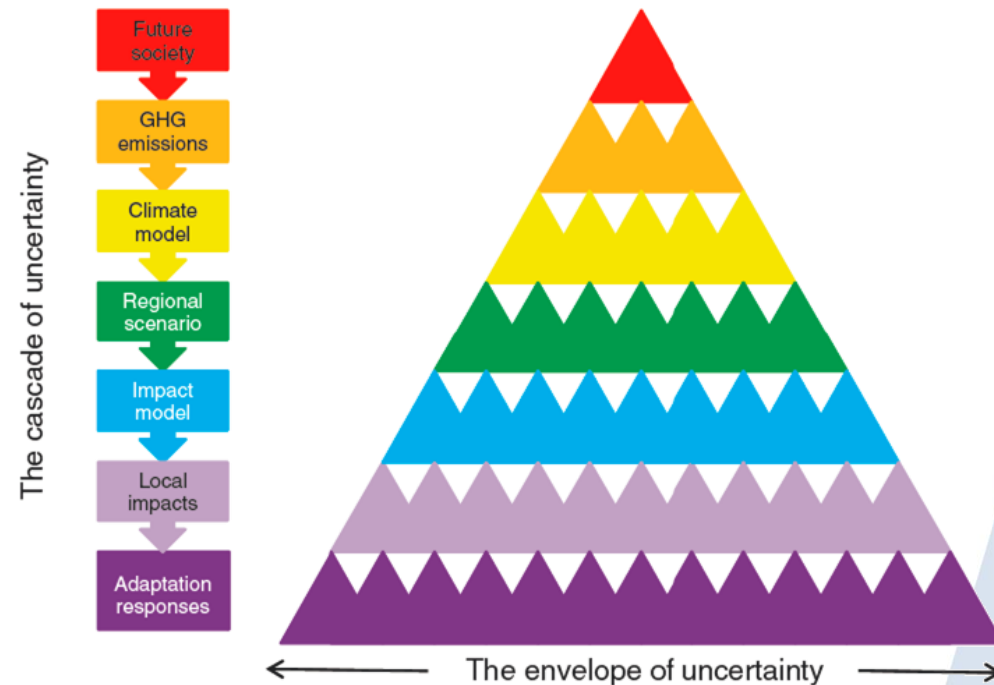
**Rockfalls:** degradation of permafrost due to global warming will favour an increase in the frequency of rockfall above the permafrost limit.



**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"> <li>German Committee for Disaster Reduction</li> <li>Federal Office of Civil Protection and Disaster Assistance</li> <li>Regional council Freiburg</li> <li>Technical Advisor forest fires</li> <li>Political decision-makers</li> </ul>
Austria (BWF): Rockfalls & Landslides	11	Local, regional and national	<ul style="list-style-type: none"> <li>representatives of public authorities,</li> <li>support organizations of the federal states</li> <li>fire brigades and CP and disaster management</li> <li>Mayor and technicians of the Municipalities of 5 Terre</li> </ul>
Italy (CIMA): Wildfires	16	Local, regional and national	<ul style="list-style-type: none"> <li>Regional Civil Protection sector (Liguria)</li> <li>Regional Department of agriculture, fire fighting (Liguria)</li> <li>National Civil Protection Department</li> </ul>
Italy (CIMA): Floods	15	Local, regional and national	<ul style="list-style-type: none"> <li>Mayor and technicians of the Municipalities of 5 Terre</li> <li>CP sector of Liguria Region</li> <li>National Civil Protection Department</li> </ul>
Spain (PCF, DGPC CAT, ICGC, CTFC): Wildfires & Avalanches	8	Regional	<ul style="list-style-type: none"> <li>Catalan Fire and Rescue Service</li> <li>Catalan Civil Protection body</li> </ul>
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"> <li>Political decision-makers</li> <li>representatives of public authorities,</li> <li>support organizations of the federal states</li> <li>fire brigades and CP and disaster management</li> </ul>
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 rise risk awareness of communities also by involving the population and reinforcing communication
- 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)

## Needs/Priorities of risk managers

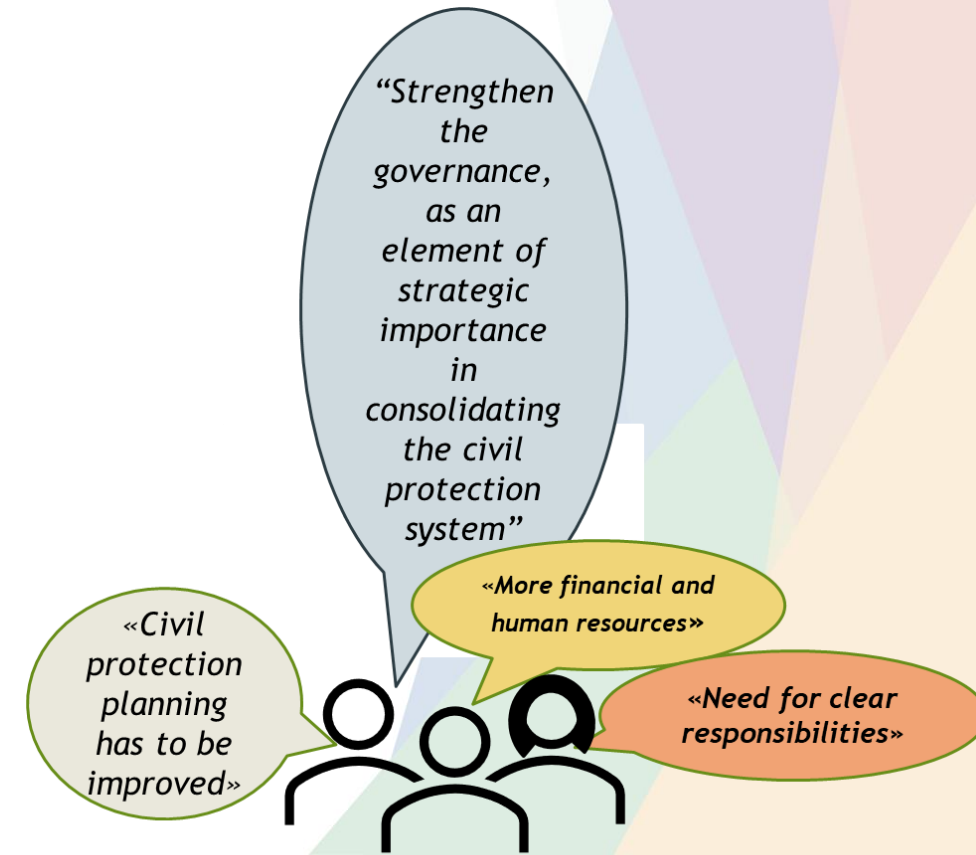
- to reinforce the collaboration and cooperation between institutions and
- to reinforce risk awareness and risk perception and to involve the population
- to innovate the approach of risk management from “protect all” to “live with”
- to better understand new risk scenarios and to integrate CC impact 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

# Requirements of civil protection and risk managers for facing CC

Strengthen the collaboration and cooperation

Rise risk awareness of the population also by involving the population in the DRM measures

Improve EWS





## Requirements of civil protection and risk managers for facing CC

Knowledge of  
climate change new  
risk scenarios and  
their uncertainties

Integrate CC  
impacts in risk  
analysis and  
mapping

From «protect all»  
to «live with»

Integrate  
territorial, urban  
planning, forest and  
agricultural policies  
in DRR

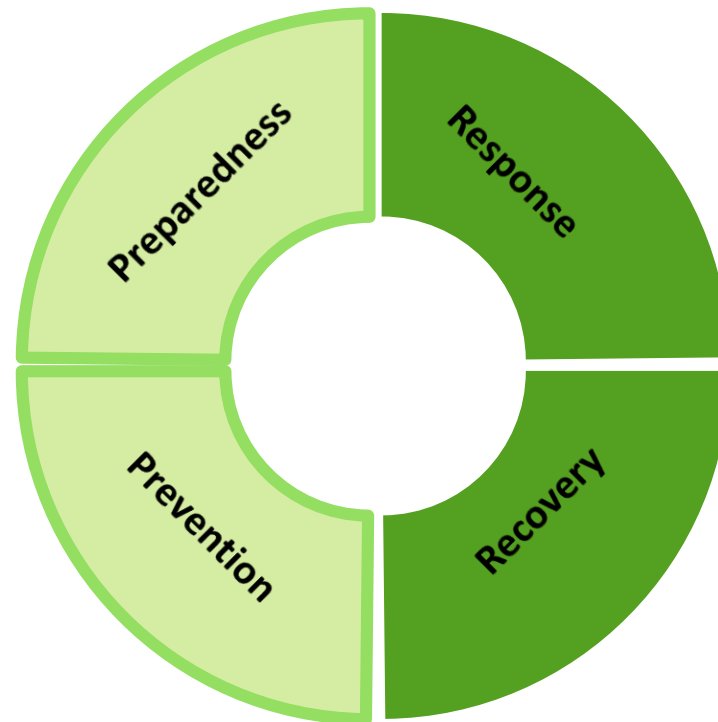
Manage current  
exposure and  
vulnerabilities

Integrate climate  
change scenarios in  
multi-hazard  
assessment and  
planning

## Requirements of civil protection and risk managers for facing CC

These needs are referred to all the phases of the risk management cycle,

but more emphasis is on **prevention and preparedness**



# 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).



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



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For detailed results visit

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

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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!



# RECIPE

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

Thanks for the attention!



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