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## **Networking for the European Forest Risk Facility initiative**

**Interactions and feedback mechanisms between risks  
and social processes relevant for risk management.  
A civil protection perspective**

Andrea Duro, Emilio D. Iannarelli  
Italian Department of Civil Protection

Cagliari, 11<sup>st</sup> April 2018





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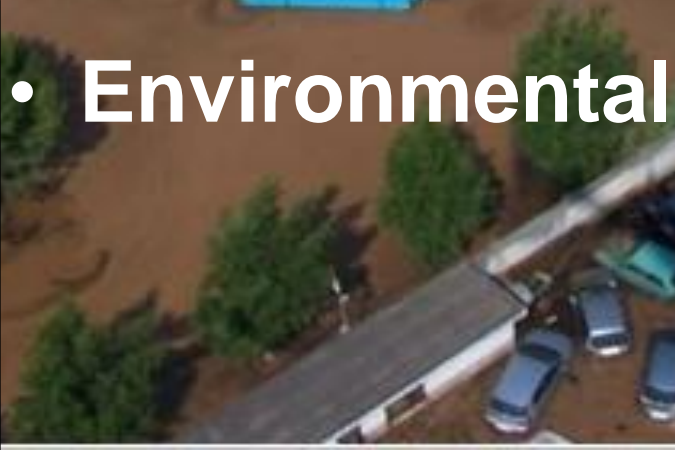


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# **Introducing Italian Civil Protection**

# Risks

- Seismic
- Volcanic
- Hydro-geological
- Forest fires
- Technological
- Industrial and nuclear
- Environmental







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# A long history of lessons learned



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**1908 Earthquake of Messina**



**1966 Flood of Arno river**



**1968 Earthquake of Belice**



**1976 Earthquake of Friuli**



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# The turning point



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In November 1980, a strong earthquake struck Southern Italy. About 3,000 people were killed and some 10,000 injured.

During the event, national assistance was not coordinated by a central authority.

The Italian Department of Civil Protection was established in 1982.





# Mandate

The National Civil Protection System aims at safeguarding human life and health, goods, national heritage, human settlements and the environment from all natural or man-made disasters.





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# The Tasks

## Mitigation

REDUCING/MITIGATING DAMAGES  
RAISING POPULATION AWARENESS ENHANCE SELF PROTECTION MEASURES

## Alert

ANALYSIS OF CAUSES AIMED AT IDENTIFYING RISK TYPOLOGIES AND AREAS AFFECTED BY RISKS

## Response

OPERATIONS AIMED AT FULFILLING THE BASIC NEEDS OF THE POPULATION AFFECTED BY THE EVENT BASED ON PREVIOUSLY ELABORATED EMERGENCY RELIEF PLANS

## Recovery

INTERVENTIONS AIMED AT RESTORING NORMAL LIFE CONDITIONS





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# The “Actors”



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The Department of Civil Protection is today the coordination body of the Italian National System of Civil Protection.

This System was established by a specific law (n. 225) in 1992 and involves many different Organisations:

- **Public** (Government, Ministries, Regions, Provinces, Municipalities, Operational Bodies etc.)
- **Scientific/Academic** (Universities, Research Institutes, etc.)
- **Civil Society** (Volunteers, private companies)







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# Hydrogeological and hydraulic risk in Italy

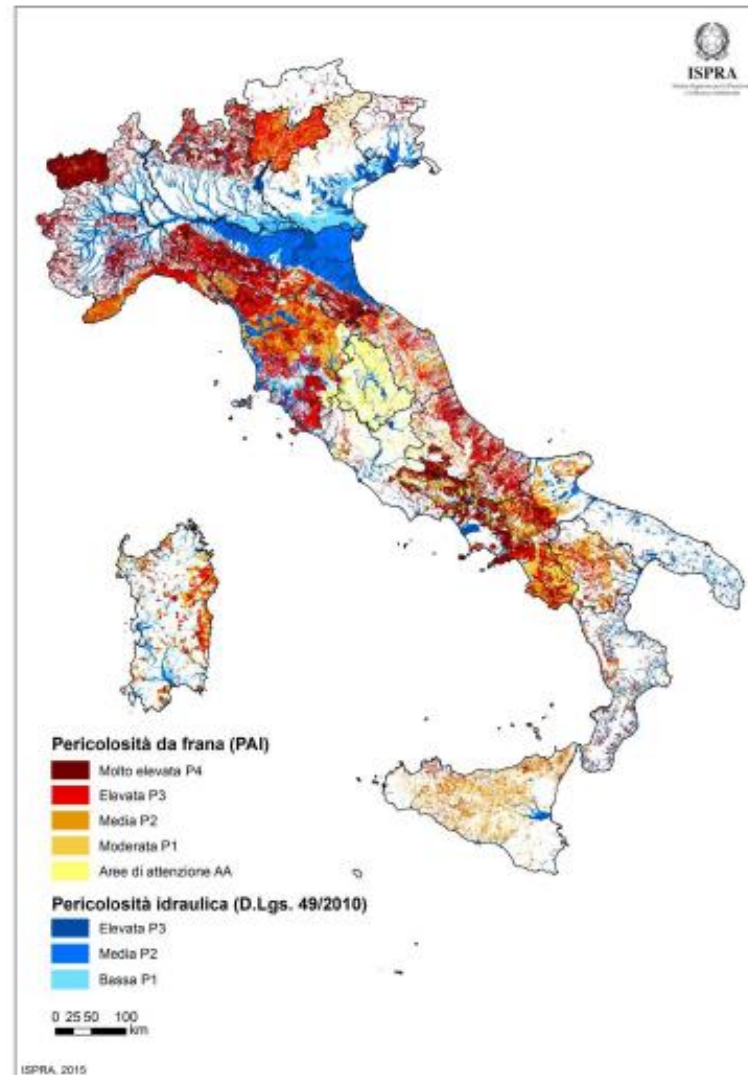


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# Hydrogeological and hydraulic hazard in Italy



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Hydrogeological hazard (landslide) according to the Hydrogeological Management Plans and hydraulic hazard according to d.lgs. n. 49/2010 («Flood Directive», 2007/60/CE). Source: ISPRA, 2015.



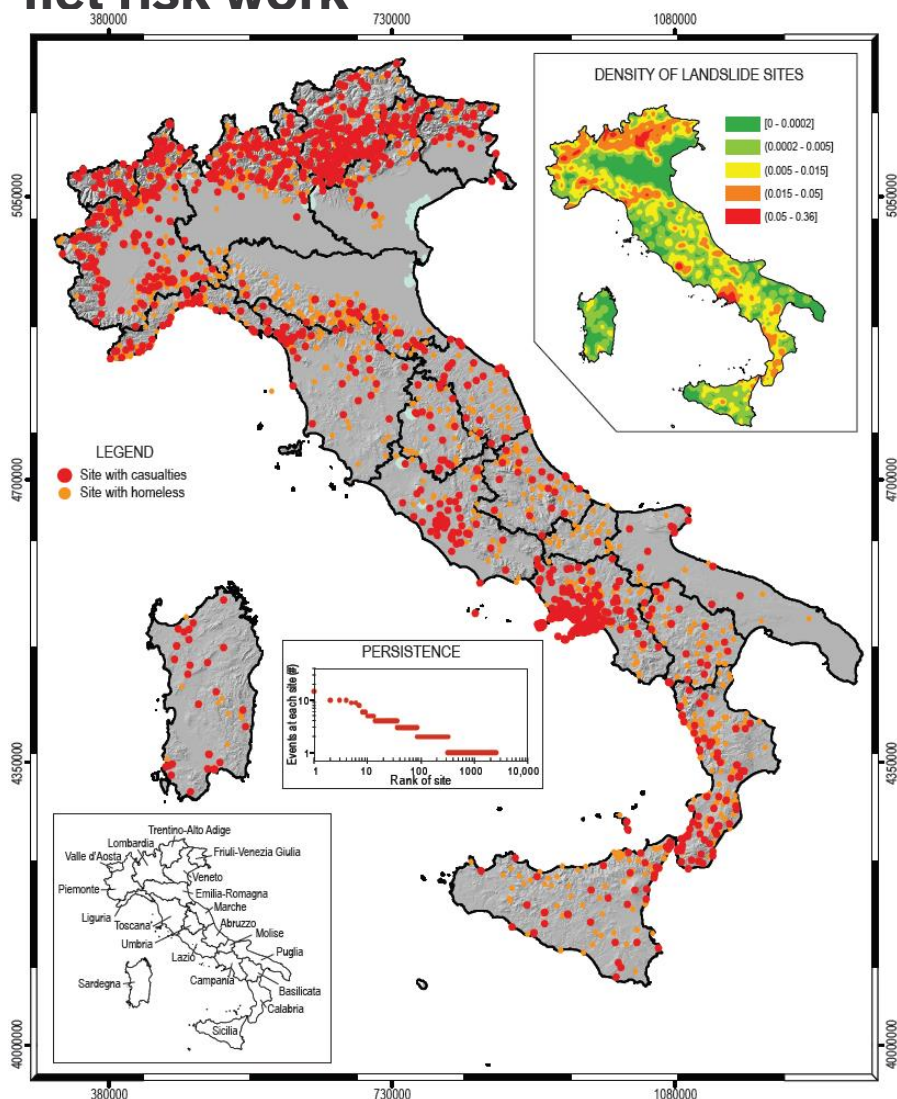


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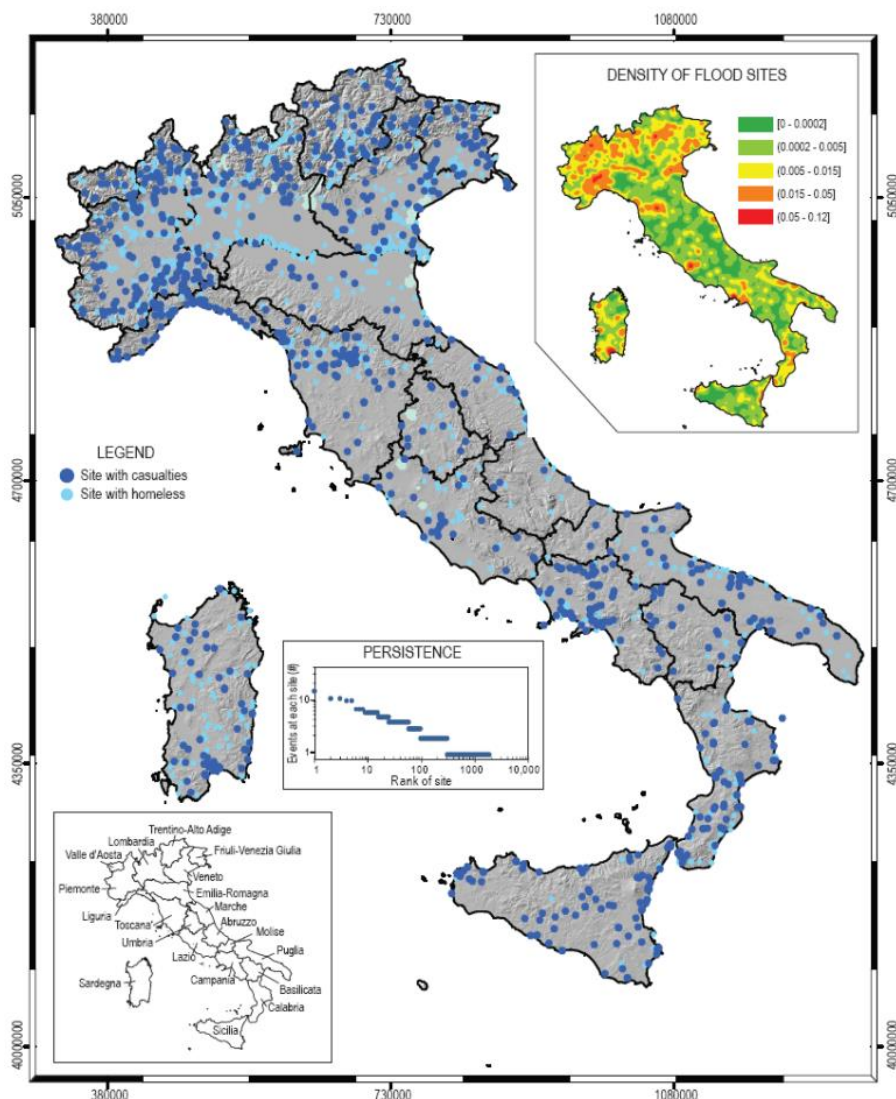
# Societal landslide and flood risk in Italy



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Location of 2533 sites affected by **landslide** events with direct consequences to the population. **Period 650-2008**



Location of 1836 sites affected by **floods** events with direct consequences to the population. **Period 590-2008**



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# Societal landslide and flood risk in Italy



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	Landslides				Floods			
	843-1849	1850-1899	1900-1949	1950-2008	671-1849	1850-1899	1900-1949	1950-2008
Length of period (yr)	1007	50	50	59	1189	50	50	59
Deaths (a)	7477	614	1119	4077	37018	674	2310	1124
Missing persons (b)	-	-	8	26	4	2	13	90
Injured people (c)	5	49	406	2019	21	8	467	1485
Fatalities (a+b)	7477	614	1207	4103	37022	676	2332	1214
Casualties (a+b+c)	7487	663	1613	6122	37043	684	2799	2699
Evacuees and homeless people	2729	2185	11026	177376	17614	119293	44653	497334
Largest number of fatalities in an event	1200	81	220	1952	15000	134	209	84
Largest number of casualties in an event	1200	81	200	2035	15000	134	209	341
Total number of events	210	162	509	2204	269	180	667	1654
With known number of casualties	107	82	360	967	115	95	337	613
With known number of fatalities	107	82	306	656	115	94	298	520
With unknown number of casualties	33	3	7	3	70	26	6	1
Average number of fatalities per event	69.8	7.4	3.9	6.2	321.9	7.2	7.8	2.3
Average number of casualties per event	69.9	8.0	4.5	6.3	322.1	7.2	8.3	4.4

Source: Salvati et. al., 2010.



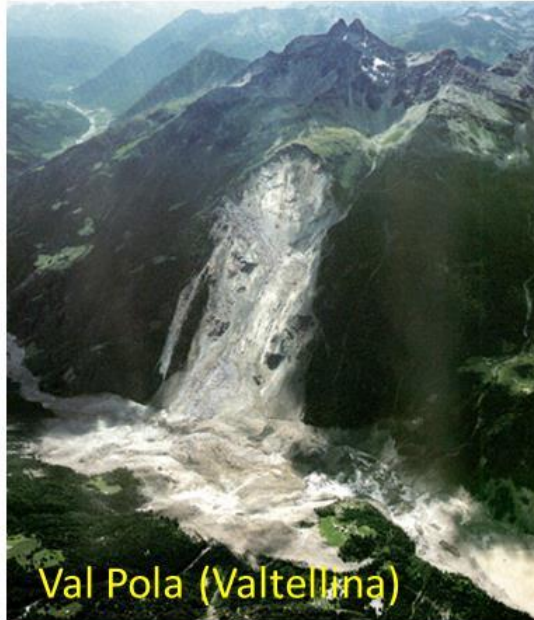


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# Different types of hydrogeological phenomena



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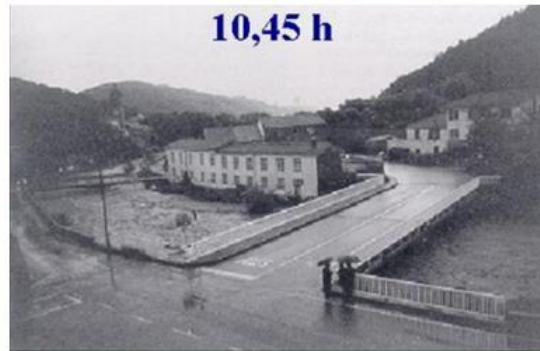
Val Pola (Valtellina)



Sarno



Tevere



10,45 h



15,30 h



15,40 h



15,45 h

Torrente Quiliano (Savona)



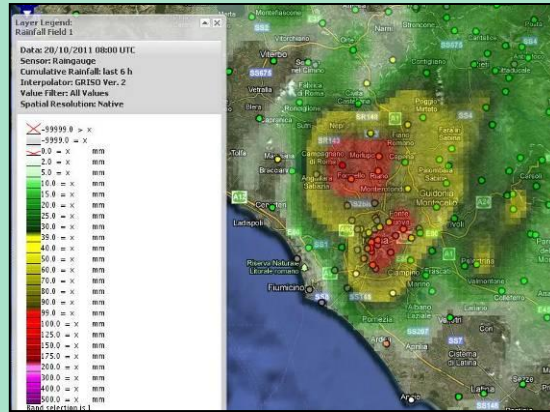
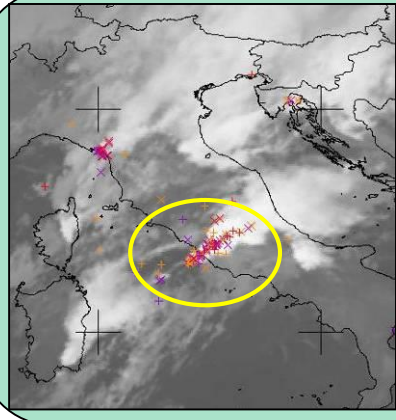


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# Mediterranean Storms

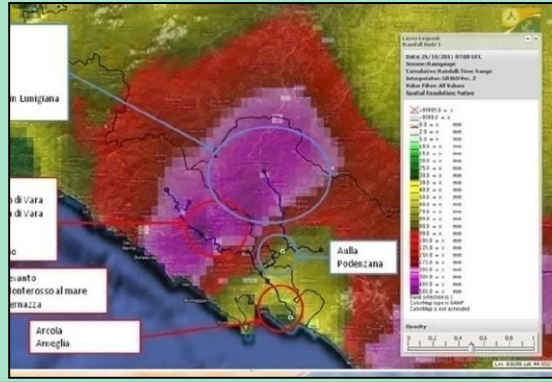


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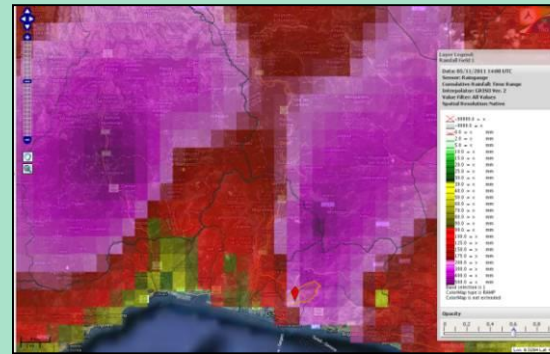
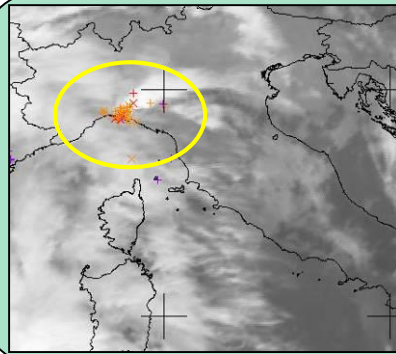
**20/10/2011  
Rome**

**91,2mm/1h  
152,0mm/2h  
158,6mm/3h**



**25/10/2011  
Tuscany  
Liguria**

**153,0mm/1h  
328,0mm/3h  
472,0mm/6h\*  
539,0mm/24h**



**05/11/2011  
Genoa**

**181,0mm/1h\*  
337,0mm/3h  
386,0mm/6h  
485,0mm/12h  
511,0mm/24h**





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# Inappropriate territorial and urban planning



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Genova – Via Giotto



Monzuno (BO)



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# Inappropriate territorial and urban planning



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Messina – loc. Mili San Pietro

Roma – Via Prenestina





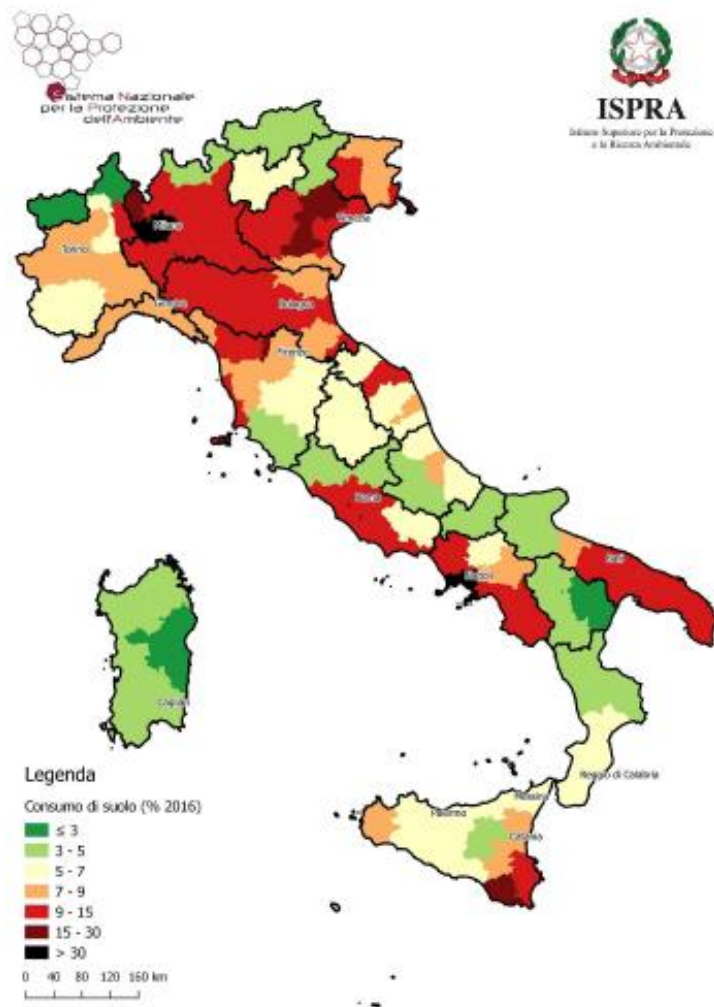


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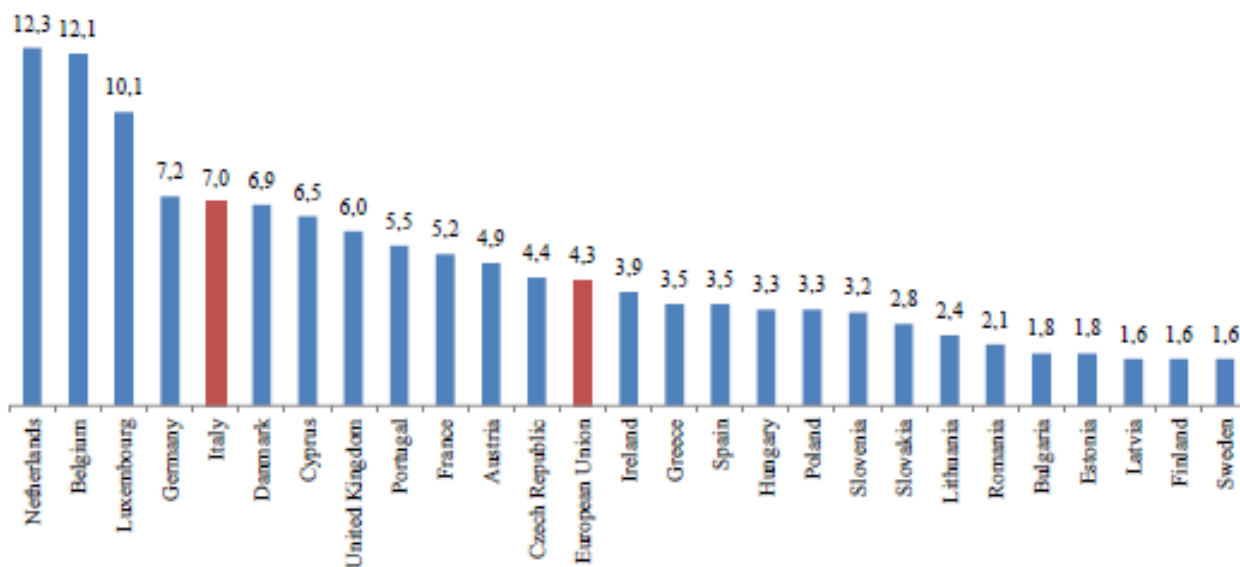
# Soil consumption



Percentage of soil consumption in 2016, on provincial basis. Source: ISPRA, 2017.



Construction of a shopping center in Rome. The same site in 2015 (left) and 2016 (right). Source: ISPRA, 2017.



Percentage of soil consumption in European Countries in 2012. Source: Eurostat in ISPRA, 2017.





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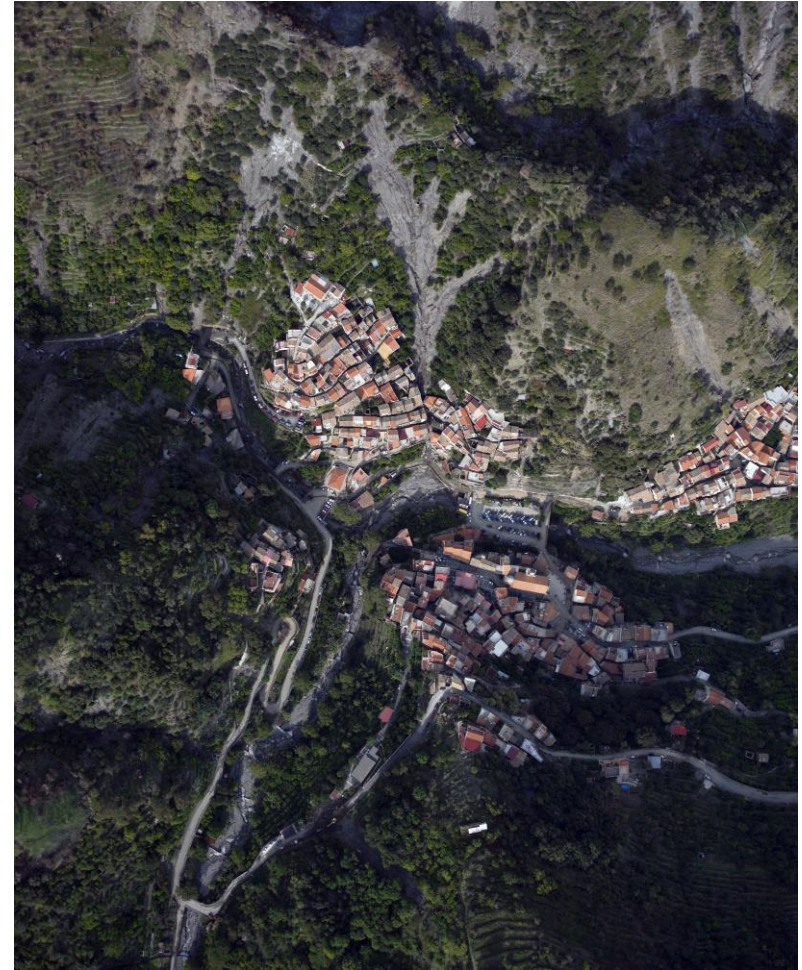
# Abandonment of the territory



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Messina 01.10.2009



Itala (ME) 01.10.2009



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# Event and risk scenarios



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# Analysis of the hydrogeological events



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Analysis of the events with casualties  
hydrogeological and hydraulic events  
in the last years  
(Years 2009-2012, Sardinia 2013).

40 events

91 casualties

10 scenarios

Source: CAMILab (University of Calabria – Faculty of Engineering).





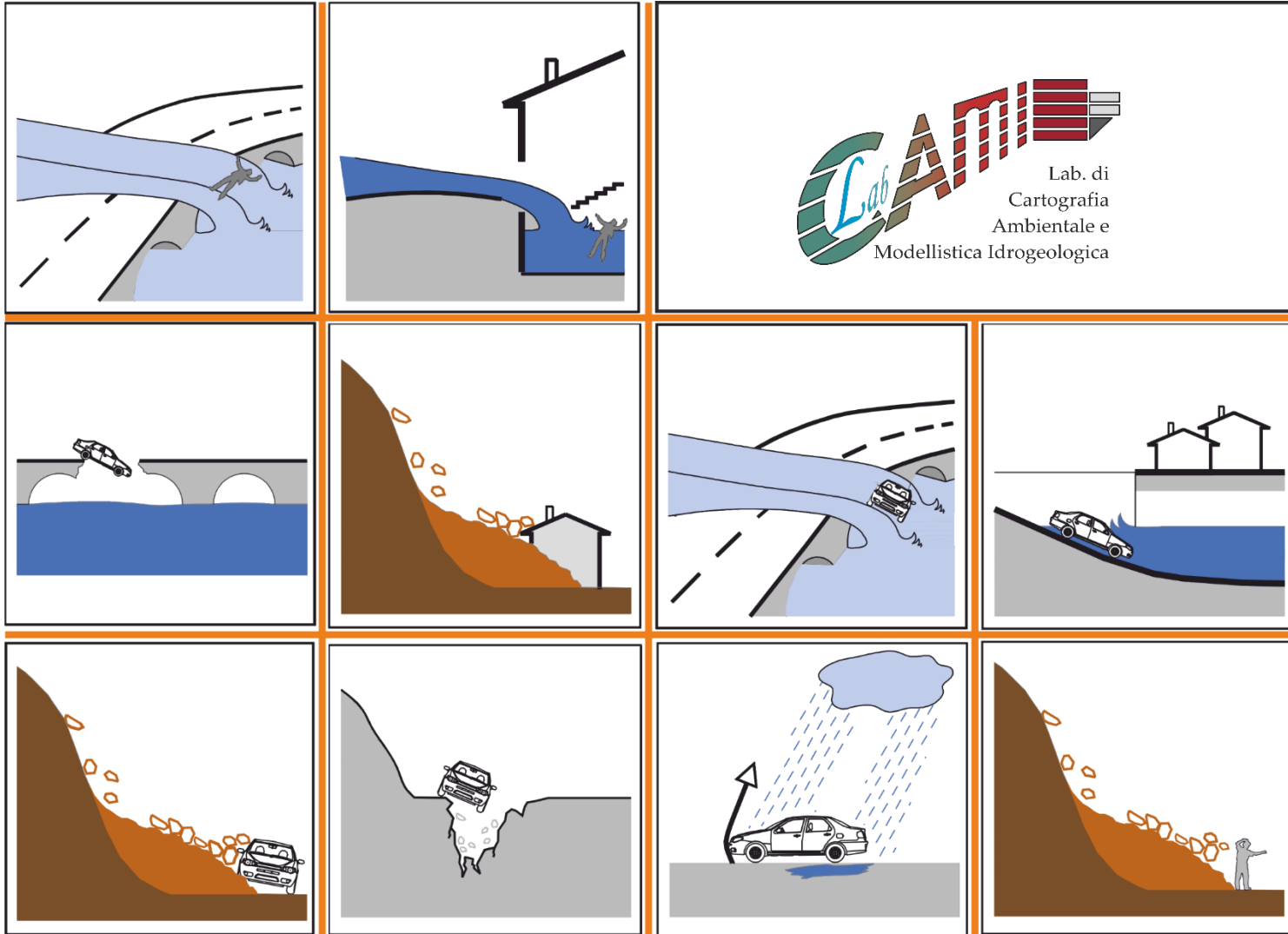


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# People risk scenarios



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Source: CAMILab (University of Calabria – Faculty of Engineering).



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- Despite huge improvements of monitoring techniques and the large availability of data and information about event and risk scenarios, floods and landslides continue to be characterized by heavy casualties and heavy damages;
- Hydrogeological and hydraulic risk is not only a natural one, but is also a «human-induced risk». Social processes are not negligible in risk hydrogeological assessment;
- Increase of exposure caused by urban sprawl and inappropriate territorial and urban managements are key causes of hydrogeological and hydraulic risks;
- Human behavior is a key factor in the degree of vulnerability and the likelihood of disasters taking place;
- Combination of structural and non structural measures is needed to substantially reduce the risk;



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# Risk governance





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# A evolving approach



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Main characteristics	Security approach	Risk approach
<b>Aim</b>	protection against threat emanating from flood events	develop a strategy ho to handle flood risk, define which level of risk is acceptable
<b>Terminology</b>	danger, threat, security, protection	risk, residual risk, risk evaluation, risk management, risk governance
<b>Scenarios</b>	medium-probability events (HQ100) as the standard level of protection	high-/medium- and low-probability events, priorities regarding level of protection
<b>Measures</b>	focus on structural measures	combination of structural and non-structural measures
<b>Involved parties</b>	sectoral planning (water authority), top-down, implementation gap	interdisciplinary, bottom-up elements
<b>Spatial focus</b>	local solutions for local problems, oriented at administrative borders	across administrative borders, catchment-based
<b>Time aspect</b>	short-term solutions, event-driven, «trial and error»	medium-/long-term solutions, prevention, regular revisions

Source: Wagner (2008) in Heintz et al. (2012).

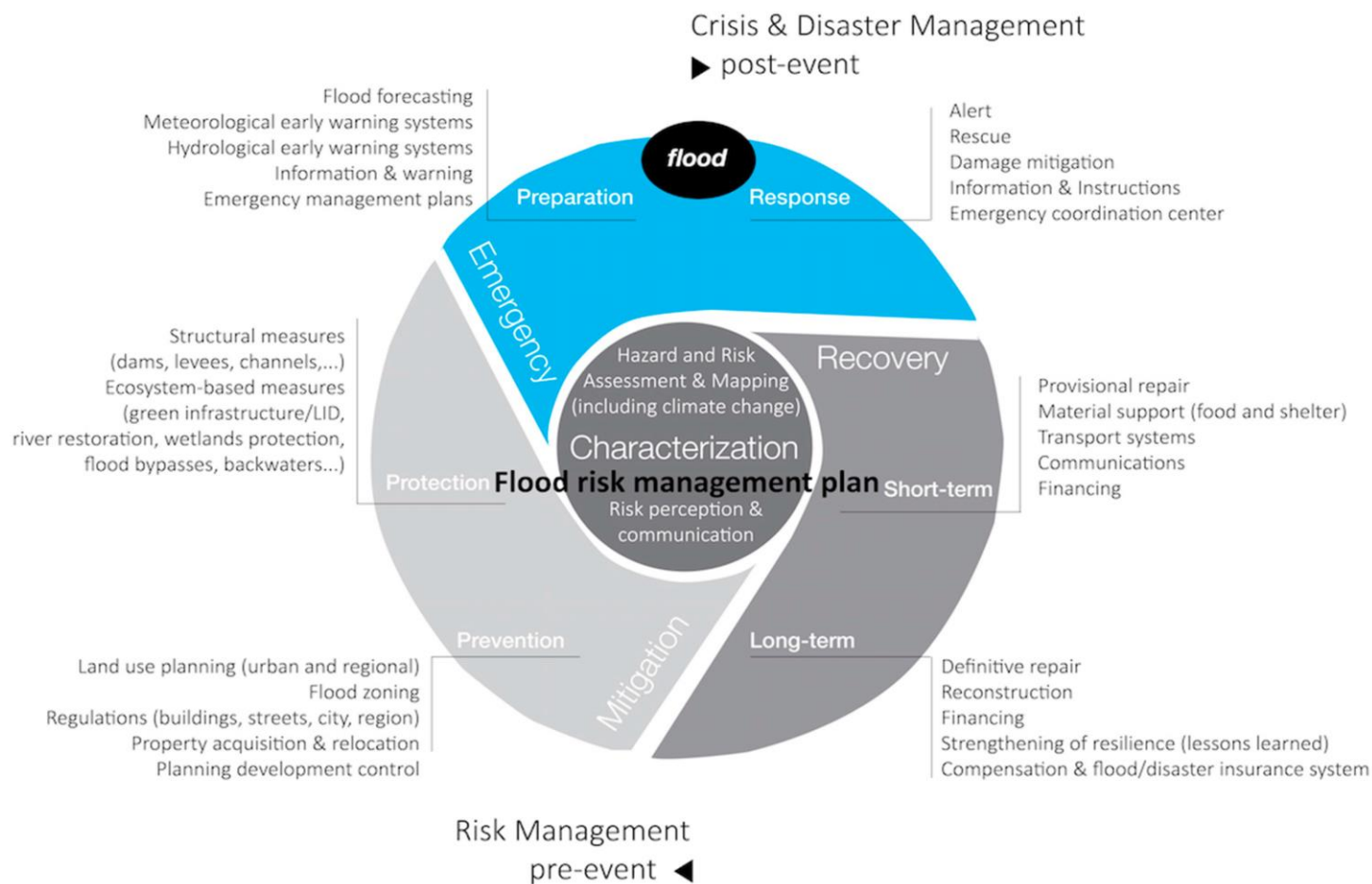


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# Flood Risk Management Plans



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# Real and No-real time activities for the prevention of hydrogeological and hydraulic risk

**Activities, even extraordinary and temporary ones, that contribute to assure urgent actions aimed to protect people, goods, settlements and environment by damage arising from dangerous events**

## REAL TIME

CIVIL PROTECTION  
DEPARTMENT

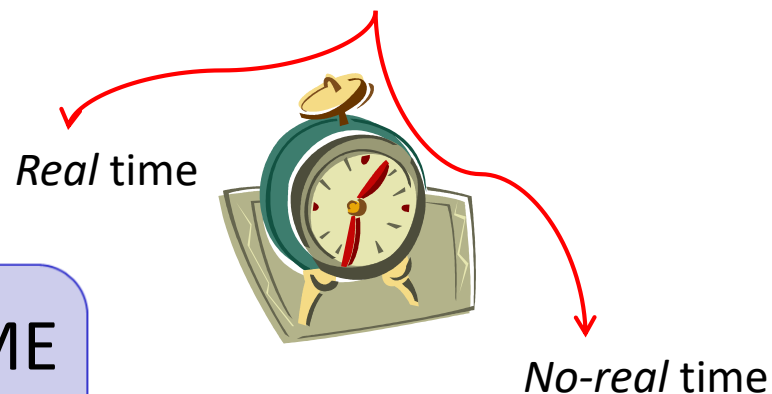
REGIONS/  
MUNICIPALITIES

## NO-REAL TIME

Ministry of  
Environment

Regions/River  
basin authorities

## HYDRAULIC AND HYDROGEOLOGICAL RISK



**Ordinary planning of interventions aimed to assure permanent and homogeneous conditions for promotion, conservation and recovery of environmental and territorial circumstances suited to the interests of communities and quality of life**



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# The Italian Early Warning System



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Dir. P.C .M. 27/02/2004

## TASKS

- ☐ Announcement, monitoring and surveillance of risk scenarios in real time
- ☐ Declaration of the expected severity levels
- ☐ Warnings → activation of operative response in real time at different territorial levels

2 phases

1. FORECAST

2. MONITORING AND  
SURVEILLANCE

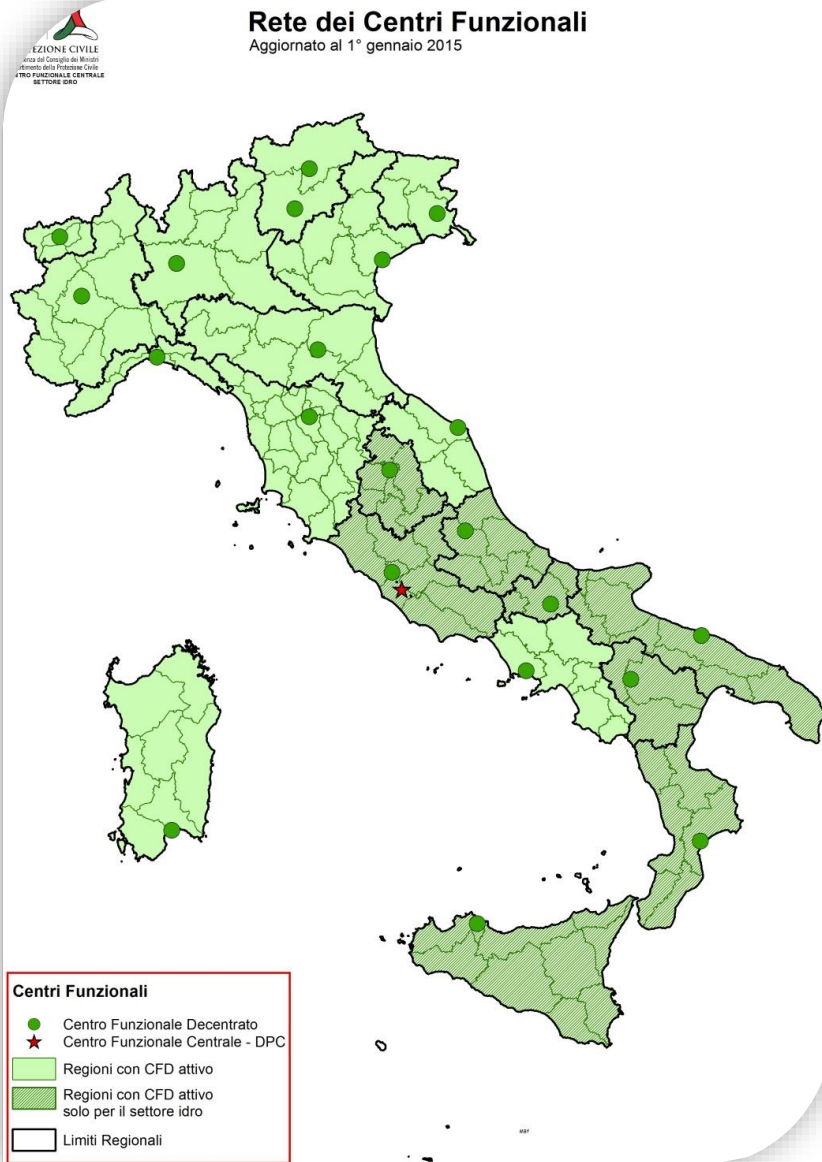
2 areas

1. METEOROLOGICAL

2. HYDROGEOLOGICAL  
AND HYDRAULIC

## Rete dei Centri Funzionali

Aggiornato al 1° gennaio 2015







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# The relevance of Risk awareness



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Io non rischio – I don't take risks is a national communication campaign on best practices of civil protection. But before that, Io non rischio – I don't take risks is an intention, an exhortation that must be taken literally. Italy is a country exposed to many natural risks, and this is a fact. But it is also true that the individual exposition to such risks can be considerably reduced through the knowledge of the problem, the awareness of the possible consequences and the adoption of a few simple expedients. And through knowledge, awareness and best practices being able to say, exactly: "I don't take risks" .





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# Involvement of the citizens



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## Decree legislative n. 1/2018

The National Service of Civil Protection promotes initiatives in order to increase communities resilience, fostering citizens participations to civil protection planning, knowledge and civil protection culture dissemination.

Components of the National Service of Civil Protection give citizens information about risk scenarios and organization of the territorial civil protection services, also in order to allow the adoption of selfprotection measures in emergency situations.

During emergency situations, citizens must comply with provisions given by Civil Protection Authorities.







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# Organized volunteerism and civil protection planning



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## Decree legislative n. 1/2018

Organized volunteerism takes part to civil protection planning and execution.



Photo: R. Ferrari, Consulta Provinciale Protezione Civile di Modena.





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# **Towards resilient communities**



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# Resilience



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Is the capacity of a system to absorb a disturbance and re-organize itself in order to recover (...more or less) its functions, its structure, its internal and external relations, substantially maintaining its identity

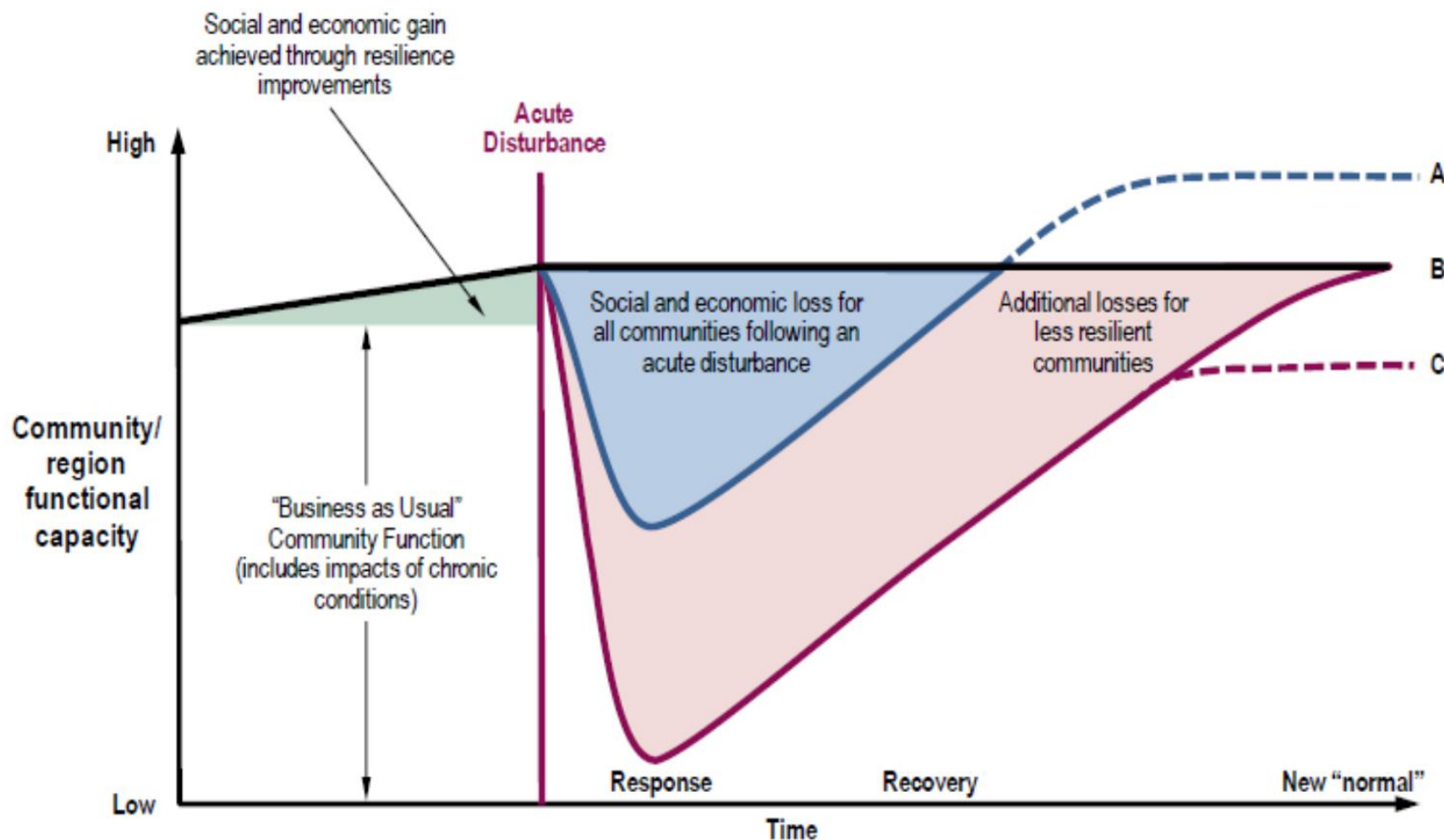


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# The Resilience Loss Recovery Curve





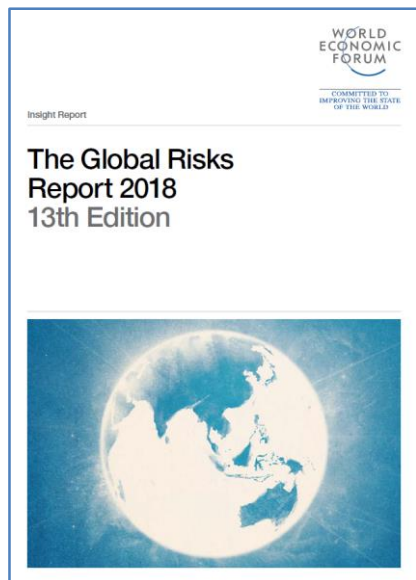


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# Global Risk Interconnections



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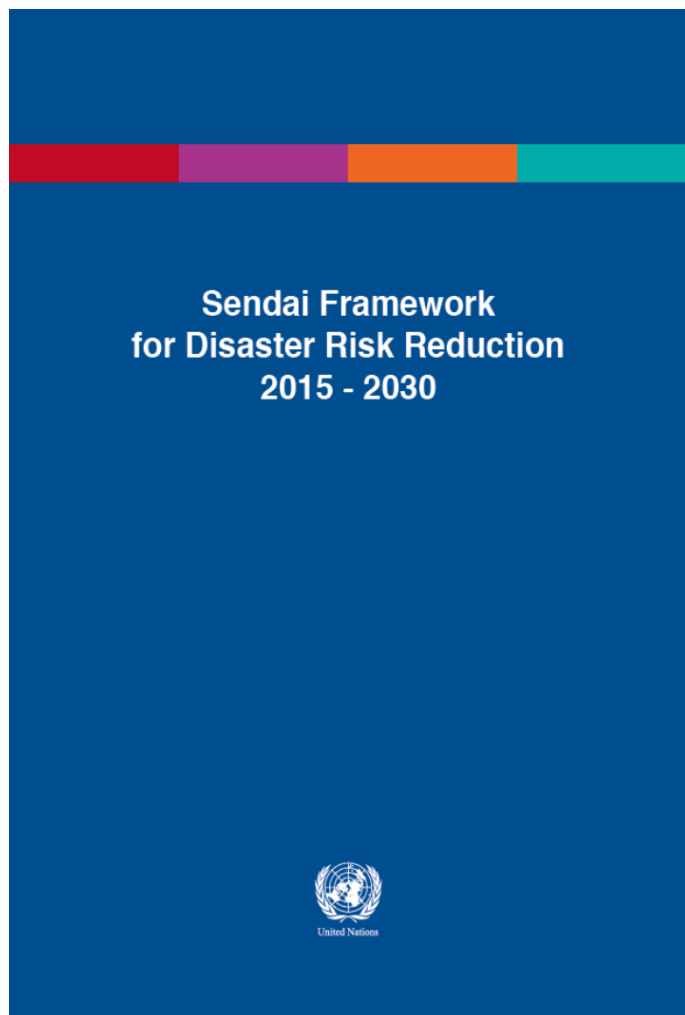
Perceived  
interconnections  
among the different  
types of risk





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# The Sendai Framework for Disaster Risk Reduction 2015-2030



There has to be a broader and a more people-centred preventive approach to disaster risk. Disaster risk reduction practices need to be multi-hazard and multisectoral, inclusive and accessible in order to be efficient and effective. While recognizing their leading, regulatory and coordination role, Governments should engage with relevant stakeholders, including women, children and youth, persons with disabilities, poor people, migrants, indigenous peoples, volunteers, the community of practitioners and older persons in the design and implementation of policies, plans and standards. There is a need for the public and private sectors and civil society organizations, as well as academia and scientific and research institutions, to work more closely together and to create opportunities for collaboration, and for businesses to integrate disaster risk into their management practices

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience



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[www.preventionweb.net/go/sfdr](http://www.preventionweb.net/go/sfdr)  
[www.unisdr.org](http://www.unisdr.org)  
[isdr@un.org](mailto:isdr@un.org)

## Chart of the Sendai Framework for Disaster Risk Reduction 2015-2030

### Scope and purpose

The present framework will apply to the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or manmade hazards as well as related environmental, technological and biological hazards and risks. It aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors.

### Expected outcome

The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries

### Goal

Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience

### Targets

Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015	Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015	Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030	Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030	Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020	Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030	Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030
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### Priorities for Action

There is a need for focused action within and across sectors by States at local, national, regional and global levels in the following four priority areas.

**Priority 1**  
Understanding disaster risk

**Priority 2**  
Strengthening disaster risk governance  
to manage disaster risk

**Priority 3**  
Investing in disaster risk reduction for  
resilience

**Priority 4**  
Enhancing disaster preparedness for effective  
response, and to «Build Back Better» in  
recovery, rehabilitation and reconstruction





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# Sendai Framework and others Intl Strategies



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# The European Action Plan on the Sendai Framework for Disaster Risk Reduction 2015-2030



## A disaster risk-informed approach for all EU policies

Key Area 1 – Building risk knowledge in all EU policies

Key Area 2 – An All-of society approach in disaster risk management

Key Area 3 – Promoting EU risk informed investments

Key Area 4 – Supporting the development of a holistic disaster risk management approach



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# Strengthening Resilience. A National Example:



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## The PON Governance Project

National Operative Programme for the Risk Reduction for Civil Protection Purposes

«Programma Operativo Nazionale Governance 2014-2020 -

Riduzione del rischio ai fini di protezione civile»

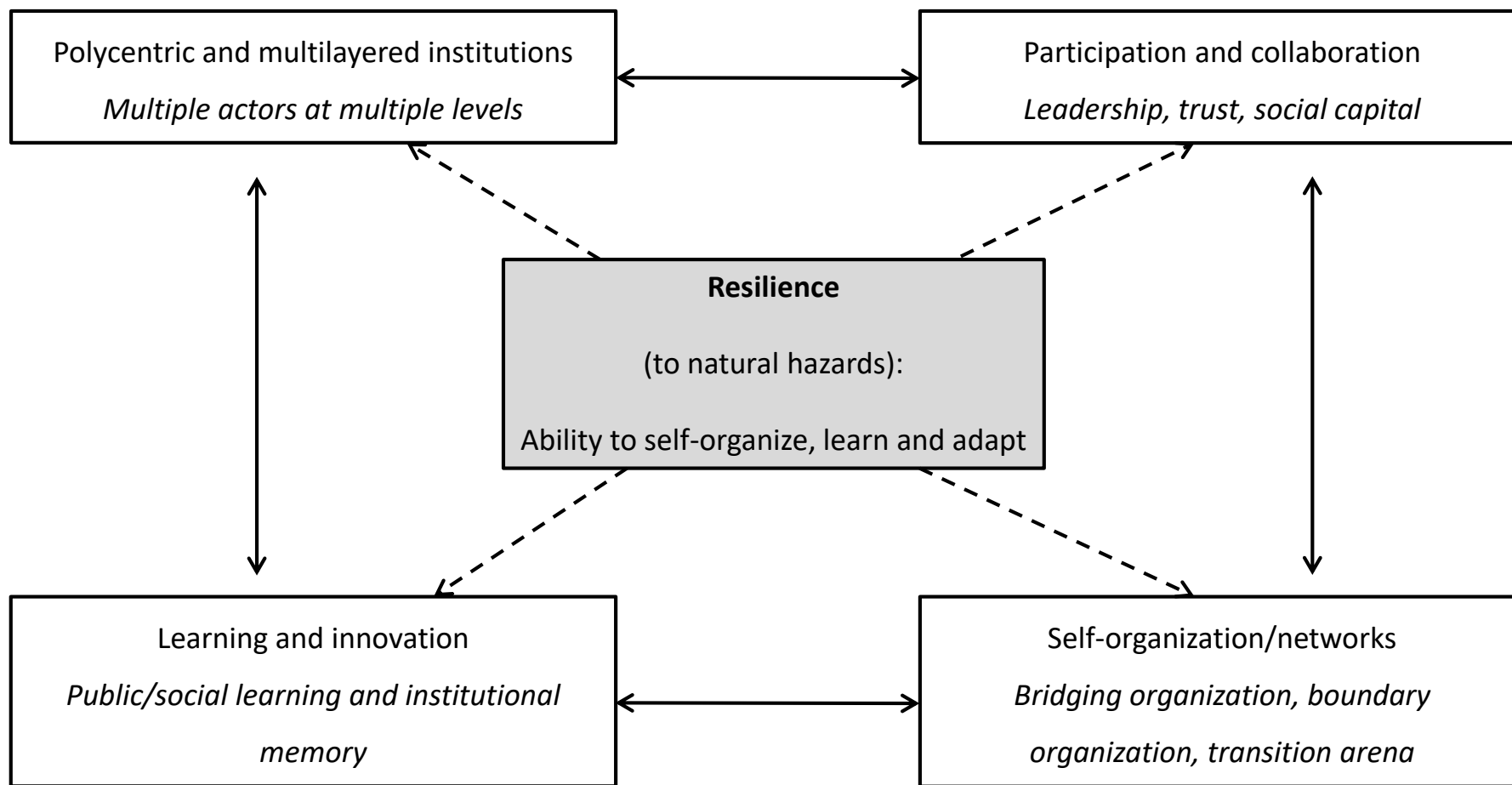


This project is aimed to the permanent strengthening of the resilience through a reinforced dialogue and cooperation between Central and Regional Authorities about civil protection themes.

Up to now, it is focused on these Regions: Apulia, Calabria, Campania, and Sicily.



# Adaptive governance and resilience



# The seven features of resilient systems:

## The Rockefeller Foundation model

### Characteristics of Resilient Systems

Finally, just understanding the systems of a city isn't sufficient. In order to build a city's resilience, those systems must be designed and functioning in a way that they can withstand, respond to, and adapt more readily to shocks and stresses. The CRF builds on decades of research on resilient systems, and identifies 7 characteristics that various city systems need.



#### Reflective

using past experience to inform future decisions



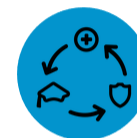
#### Resourceful

recognizing alternative ways to use resources



#### Inclusive

prioritize broad consultation to create a sense of shared ownership in decision making



#### Integrated

bring together a range of distinct systems and institutions



#### Robust

well-conceived, constructed, and managed systems



#### Redundant

spare capacity purposively created to accommodate disruption



#### Flexible

willingness, ability to adopt alternative strategies in response to changing circumstances



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# Community resilience indicators 1/3



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Dimension	Candidate variables
Ecological	Wetlands acreage and loss
	Erosion rates
	% impervious surface
	Biodiversity
	# coastal defence structures
Social	Demographics (age, race, class, gender, occupation)
	Social networks and social embeddedness
	Community values-cohesion
	Faith-based organizations
Economic	Employment
	Value of property
	Wealth generation
	Municipal finance/revenues



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## Community resilience indicators 2/3



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Dimension	Candidate variables
Institutional	Participation in hazard reduction programs
	Hazard mitigation plans
	Emergency services
	Zoning and building standards
	Emergency response plans
	Interoperable communications
	Continuity of operation plans
Infrastructure	Lifelines and critical infrastructure
	Transportation network
	Residential housing stock and age
	Commercial and manufacturing establishment

Source: Cutter et al., 2008.





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# Community resilience indicators 3/3



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Dimension	Candidate variables
Community competence	Local understanding of risk
	Counseling services
	Absence of psychopathologies (alcohol, drug, etc.)
	Health and wellness (low rates mental illness)
	Health and wellness (stress-related outcomes)
	Quality of life (high satisfaction)

Source: Cutter et al., 2008.



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# A new emerging profession

To deal with con resilience



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## Top 10 skills

### in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

### in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity





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# Business and resilience



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Rome, 7<sup>th</sup> december, 2016



Italy's Confindustria business umbrella body and the country's Civil Protection Department have signed a **five-year deal** to enhance the resilience of companies and reduce the risk of disasters.

A key feature of the newly-linked agreement is a joint action plan for small and medium enterprises, precisely the kind of firms that in many economies struggle to offset the risks posed by natural and human-induced hazards compared to their corporate giant counterparts.

It also aims to build a culture of civil protection through the active engagement of enterprises, citizens and local communities in designing and implementing preventive measures as well as in the response to emergencies.

The move is an important one given that countries around the globe are working to implement the Sendai Framework for Disaster Risk Reduction.



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it's an attitude that, through  
continuity, prepares for change







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## The job to be done...

in order to develop the new CP code's provisions

1. Better understanding of the leverage points for each kind of community (municipalities, schools, workplaces, etc.)
2. To Define a very simple system of proxy indicators in order to measure the resilience processes at community level
3. To Find at local level actors (resilient citizen champions and/or groups) capable to activate and sustain resilient processes
4. To implement and refine the right governance interface between empowered citizens/groups and local administrations
5. To empower local civil servants and different types of civil protection operators with a brand new set of skills , more focused on social dynamics and on a “anticipation” mindset



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**PROTEZIONE CIVILE**

Presidenza del Consiglio dei Ministri  
Dipartimento della Protezione Civile

**Thank you for attention!**

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