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Journal of
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EXTREME WEATHER EVENTS CAUSED BY CLIMATE CHANGE

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Cover Image: Wind travels across Lake Washington, buffeting the 520 floating bridge as the storm grows in strength. (Steve Ringman / The Seattle Times).

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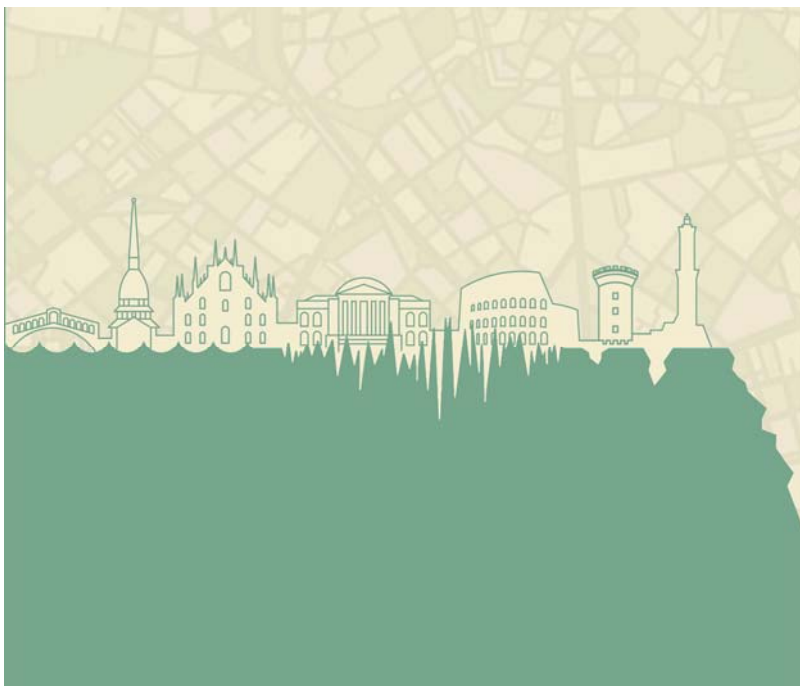
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CITIES AT RISK: STATUS OF ITALIAN PLANNING SYSTEM IN REDUCING SEISMIC AND HYDROGEOLOGICAL RISKS

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ABSTRACT

Italy and its urban systems are under high seismic and hydrogeological risks. The awareness about the role of human activities in the genesis of disasters is achieved in the scientific debate, as well as the role of urban and regional planning in reducing risks. The paper reviews the state of Italian major cities referred to hydrogeological and seismic risk by: 1) extrapolating data and maps about seismic hazard and landslide risk concerning cities with more than 50.000 inhabitants and metropolitan contexts, and 2) outlining how risk reduction is framed in Italian planning system (at national and regional levels). The analyses of available data and the review of the normative framework highlight the existing gaps in addressing risk reduction: nevertheless a wide knowledge about natural risks afflicting Italian territory and an articulated regulatory framework, the available data about risks are not exhaustive, and risk reduction policies and multidisciplinary pro-active approaches are only partially fostered and applied.

KEYWORDS:

Risk reduction; Italian Cities; Planning; Seismic risk; Hydrogeological risk.

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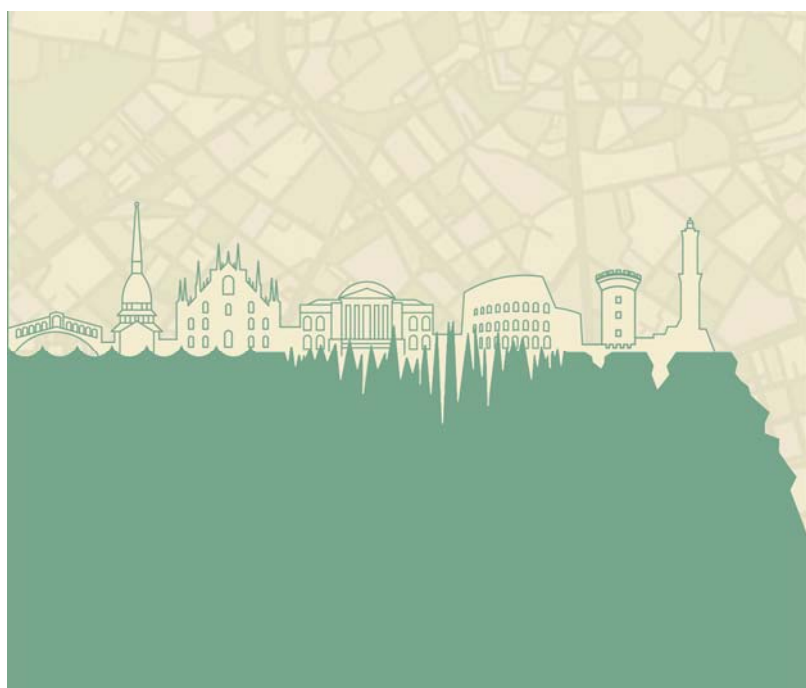
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城市正面临风险： 意大利规划系统在降低地质和水文 灾害风险中的地位

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摘要

意大利及其城市系统正面临严重的地质和水文灾害风险。人们从科学讨论的角度意识到了人类活动在《创世纪》灾难中的作用，同时也认识到城市和区域规划在降低风险中的作用。本文综述了意大利遭遇水文和地质灾害的主要城市：1) 推测了在拥有超过五万居民和大型城市环境的意大利城市中所发生地质和滑坡灾害的数据和地图。2) 强调了意大利规划系统中灾害减少的原因（基于国家和地区层面）。对可用数据的分析和对规范性框架的综述都突出了在对降低灾害风险的探求中存在着空白。然而，不论是认识到侵扰意大利边境的自然灾害，还是认识到一个清晰的监管框架和可用的灾害数据都不详尽，只有部分培养降低风险的政策和运用积极的多学科的方法才能减少灾害的发生。

关键词：

降低风险；意大利城市；规划；地质灾害；水文灾害。

1 INTRODUCTION

The Italian territory is inherently fragile, with a strong propensity to earthquake, landslides and floods. Special morphological conditions are amplified by land consumption and abandonment, a not incisive planning system, spread unauthorised urbanizations.

Around 2% of the total population of the country lives in areas with high landslide hazard, and 3% in areas with high flooding hazard¹ (Trigila et al., 2015).

The percentage rises to 41% for seismic hazard². These threats involve also Italian urban systems: the ancient and recent history of several Italian cities is a history of reconstructions (Gisotti, 2012; Guidoboni & Valensise, 2014). This contribution reviews the state of Italian major cities referred to hydrogeological and seismic risks.

Academic and scientific literature provides many definitions of “risk” and “disaster risk”, expressed as product of several components, such as likelihood of hazard, occurrence of a certain magnitude, effects on human and natural systems, vulnerability, exposure to hazards, preparedness and loss mitigation, resilience (Paul, 2011).

The main determinants of risks are commonly and globally identified in hazard, vulnerability and exposure³. The history of cities has been influenced by the necessity of defence and security from hazards (both human and natural ones) since their foundations.

The mutations lived by human societies since the XIX century have offered larger possibilities to overcome and control natural events. Regarding the protection from earthquakes, floods or landslides (“acts of god”), forms of mitigation, prevision and prevention through technological solutions have been the principal approach to face “natural” hazards.

Research on disaster reduction has progressively enlightened the role of human activities in provoking disasters, exacerbating natural hazards by increasing vulnerability and exposure of human settlements (Ambraseys & Bilham, 2011; Steinberg, 2000; UN World Commission on Environment and Development, 1987). Nonetheless, the necessity of reducing vulnerability and exposure achieving a larger resilience of territorial and urban systems raises in the debates mostly only after ruinous events (Guidoboni & Valensise, 2014; Menoni, 2005) and mainly to answer to general requests of “greater safety”.

Security can be defined as a dynamic non-event, using Karl Weick’s words: “dynamic” because requires constant adaptation and control; “not-event” because to be safe implicitly means to avoid an event or its consequences.

Consequently, a safe condition is not static, but it is the result of continuous works influenced by changing cultural references (Hollnagel, Woods, & Leveson, 2006; Menoni, 2005).

In fact, the process of building knowledge from unawareness and unknown emergencies to clarification and information about a known danger is filtered by cultural frameworks and collective perceptions (Alexander, 2014).

¹ Areas with “high” or “very high” level of landslide hazard (coded as zones P3 and P4 according to the plans for hydrogeological systems – PAI) and with “high” level of flooding hazard (coded as zone P3 according to the D.Lgs. 49/2010) for the implementation of the European Floods Directive 2007/60/EC) (Trigila, Iadanza, Bussettini, Lastoria, & Barbano, 2015, pp. 9-10, 37, 72, 110).

² Elaboration of the author. Data refer to Istat census 2011 (<http://dati-censimentopopolazione.istat.it/Index.aspx>) and to areas with “high” or “medium” level of seismic hazard (coded as zones 1, 2, 2A and 2B. The list of Italian municipalities classified according to micro-zone classification is available at <http://www.protezionecivile.gov.it/jcms/it/classificazione.wp> updated to March 2015).

³ “*Disaster risk* signifies the possibility of adverse effects in the future. It derives from the interaction of social and environmental processes, from the combination of physical hazards and the vulnerabilities of exposed elements. [...] *Hazard* refers to the possible, future occurrence of natural or human-induced physical events that may have adverse effects on vulnerable and exposed elements. [...] *Exposure* refers to the inventory of elements in an area in which hazard events may occur. [...] *Vulnerability* refers to the propensity of exposed elements such as human beings, their livelihoods, and assets to suffer adverse effects when impacted by hazard events” (IPCC, 2012, p. 69).

Catastrophes are examples of events that affect cultural references fostering changes in law and regulation. From this perspective, the role of urban and regional planning as technical and legislative tool for risk prevention has emerged in debates and practices, as demonstrated by national and international studies and experiences, and by the update of laws and practices⁴.

The awareness that the city is a complex relational system, consisting of interacting parts and multiple levels of organizations, leads to the necessity of non-sectorial risk reduction in urban environments. Increased safety is not derived from the sum of the safety of the individual parts (a concept well expressed by the notions of direct damages and induced effects) but it is the result of interrelated mechanisms involving the entire urban system, both in its physical and functional aspects.

The importance of planning follows consequently, given its multidisciplinary nature and role in the government of cities (Cremonini, 2009; Davoudi, Crawford, & Mehmood, 2009; Fera, 1991; Menoni, 2005; Pirlone, 2009). According to Esteban and colleagues, planning is a structural and non-structural long-term mitigation measure in reducing exposure and vulnerability of built environment (Esteban et al., 2011, pp. 132-111).

Inspired by Latour's thinking about modernity and "symmetric anthropology" (Latour, 1991), and by the idea that risk mitigation constitutes a public good (Reddy, 2000, as quoted by Menoni et al., 2011, p. 288), the paper examines hydrogeological and seismic risks in Italian major cities, and how risk reduction is framed in Italian planning system.

2 METHODS

Reports compiled by public agencies or leading research centres offer information and data about hydrogeological and seismic criticality (AA.VV., 2007, 2014; ANCE & CRESME, 2012; Ministero dell'Ambiente e della Tutela del Territorio e del Mare, 2008; Munafò et al., 2015; Trigila et al., 2015).

Data are provided at regional or provincial level maximum, without sub-classification, or focused on specific cities as samples.

The only exception is last ISPRA report n°233 (Trigila et al., 2015) providing data about landslides and floods at municipal level.

To extract detailed data about risks involving Italian cities and metropolis, the author developed specific analyses focusing on municipalities with more than 50.000 and 200.000 inhabitants⁵ and on "metropolitan cities"⁶, starting from OECD's definitions of "city".

OECD describes as "urban" a functional area with a population of 50.000 people at least. If the population is between 200.000 and 500.000 people, the urban area is defined "medium-sized".

Higher populations give birth to metropolitan areas (OECD, 2012).

Data about seismic risk are provided firstly through the selection of municipalities with a "high" or "medium" level of seismic hazard according to the national seismic micro-zoning⁷. For these cities, residential buildings built before anti-seismic building standards (L.64/74) have been highlighted⁸.

⁴ For further readings, also about the ancient experiences and practises of anti-seismic planning and urban design: Fera, 1991; Guidoboni, 2014.

⁵ Data about administrative boundaries and 2011 population census have been downloaded from ISTAT website (<http://www.istat.it/it/archivio/104317>).

⁶ According to the current legislation, Italian "metropolitan cities" are: Bari, Bologna, Florence, Genoa, Milan, Naples, Reggio di Calabria, Rome, Turin, Venice. The territory of every metropolitan city corresponds to the Province's one (L. 56/2014).

⁷ Zones 1, 2, 2A and 2B of national micro-zone classification. See also note 2.

⁸ ISTAT census offers data about the period of construction of residential buildings. Consequently, selected data concern buildings pre-1970s, structures hypothetically more vulnerable to earthquakes by comparison with the most recent ones.

Data about hydrogeological risks are provided extracting information from the appendix of 2015 ISPRA report (Trigila et al., 2015). The selection was focused on population and “urbanized surfaces” exposed to “high” or “very high” landslide hazard and “high” flooding hazard⁹.

The study is also supported by a concise reconstruction of the historical evolution and principal contents of national and regional regulations about planning and risk reduction (in force at the moment of writing), starting from the beginning of XX century.

The aim was to analyse how the role of urban and regional planning as tools for risk prevention is framed in the Italian case.

3 ITALY: WHY A FRAGILE TERRITORY?

Italy is one of the most earthquake-prone countries in the Mediterranean, due to its geographical position, in the area of convergence between the African and the Eurasian tectonic plates.

Since the beginning of XX century, 30 strong earthquakes with a magnitude superior to 5.8 have struck Italy¹⁰.

The complex orography predisposes the territory also to hydrogeological instability: Italian watersheds are generally small in size, and therefore characterized by extremely fast response to rainfall.

These peculiar morphological and geological conditions are amplified by forms of land consumption¹¹, the abandonment of mountain areas and deforestation, a not incisive planning system, spread unauthorised urbanizations, the lack of restoration and maintenance of slopes and watercourses.

A synthetic portrayal of the territory follows.

In Italy there are around 529.000 landslides: high landslide hazards concern 8% of Italian territory and around 1.224.000 inhabitants. More than 12.000 sq. km are subject to high hydraulic hazard: 4% of the territory for 1.915.000 inhabitants (Trigila et al., 2015).

Percentages rise referring to high seismic hazard, which concerns around 45% of the national surface and more than 24 million inhabitants (41% of the total population)¹².

Consequently, Italy has a very high vulnerability (due to the structural fragility of housing, infrastructures and industrial structures) and high exposure (for population density and historical and artistic heritage).

These hazards involve not only rural or mountain areas but also Italian urban systems. Ancient and recent history provide many examples of Italian cities struck by earthquakes, landslides or floods¹³.

The demand for specific research about cities derives from the urban population at the present day: around 30% of Italian inhabitants live in cities or metropolis (with reference to the mentioned threshold of 50.000 inhabitants and to the legislative definition of metropolitan city).

⁹ In ISPRA report, the estimation of the population at risk was performed by intersecting areas with maximum hydrogeological hazard (zones P3 and P4) with 2011 census sections. The indicator about “artificial surfaces” at risk was developed with a cartographic overlap between hazard maps and land consumption maps (Trigila et al., 2015, pp. 68-69). See also note 1.

¹⁰ Data from the National Institute for Geophysics and Volcanology. <https://ingvterremoti.wordpress.com/i-terremoti-in-italia/>.

¹¹ According to ISPRA's data, about 9% of land consumption in Italy involves areas threatened by hydraulic hazards (Munafò et al., 2015, p. 29).

¹² For definition of hazard levels, and information on data about seismicity, see notes 1 and 2.

¹³ For instance, since XI century, dozens of cities have been hidden by an earthquake with an intensity value of VIII or above on Mercalli scale (Guidoboni, 2014); for historical data about hydrogeological disasters, see: Gisotti, 2012; Guidoboni & Valensise, 2014.

	CITIES AND POPULATION	MEDIUM/HIGH SEISMIC RISK		HIGH/VERY HIGH LANDSLIDE RISK		HIGH FLOOD RISK	
		num. of seismic cities, related population and building stock	cities, related and residential	num. of cities subject to landslides, related population and urban surface	subject to population	num. of cities subject to floods, related population and urban surface	subject to population
7	141 cities	67 cities		91 cities [B]		124 cities [E]	
	19.986.649 inh.	9.663.834 inh.	39% of national population subject to seismic hazard 16% of national population	188.651 inh. in areas subject to landslide	1.4% of population of [B] 15.4% of national population subject to landslides	656.016 inh. in areas subject to floods	3.5% of population of [E] 34% of national population subject to floods
		700.335 pre-1970 residential buildings	54% of building stock of seismic cities	31.5 urbanized sq. km. in areas subject to landslide	7% of Italian urbanized surfaces subject to landslides	149.8 urbanized sq. km. in areas subject to floods	22% of Italian urbanized surfaces subject to floods
Municipalities with more than 50.000 inh.	16 cities	4 cities		11 cities [C]		16 cities [F]	
	9.642.273 inh.	4.773.903 inh.	19% of national population subject to seismic hazard 8% of national population	86.045 inh. in areas subject to landslide	1.2% of population of [C] 7% of national population subject to landslides	236.065 inh. in areas subject to floods	2.4% of population of [F] 12% of national population subject to floods
		173.916 pre-1970 residential buildings	60% of building stock of seismic medium-size cities	7.4 urbanized sq. km. in areas subject to landslide	1.5% of Italian urbanized surfaces subject to landslides	30.4 urbanized sq. km. in areas subject to floods	4.5% of Italian urbanized surfaces subject to floods
Municipalities with more than 200.000 inh.	10 metropolitan cities	5 metropolitan cities [A]		8 metropolitan cities [D]		10 metropolitan cities [G]	
	17.789.075 inh.	7.172.934 inh. in seismic sub-municipalities	75% of population of [A]	273.950 inh. in areas subject to landslide	2% of population of [D] 22% of national population subject to landslides	541.015 inh. in areas subject to floods	3% of population of [G] 28% of national population subject to floods
		408.243 pre-1970 residential buildings in seismic sub-municipalities	37% of building stock of seismic metropolitan cities	71.2 urbanized sq. km. in areas subject to landslide	15% of Italian urbanized surfaces subject to landslides	138.8 urbanized sq. km. in areas subject to floods	21% of Italian urbanized surfaces subject to floods
Italy	59.433.744 inh.	24.513.924 inh. living in areas subject to earthquakes	41% of national population	1.224.001 inh. living in areas subject to landslide	2.1% of national population	1.915.236 inh. living in areas subject to floods	3.2% of national population
				476.3 urbanized sq. km. in areas subject to landslide	2.7% of national urbanized surfaces	673.3 urbanized sq. km. in areas subject to floods	3.8% of national urbanized surfaces

Tab.1A Italian cities at seismic and hydrogeological risks. Data about population and buildings refer to ISTAT census 2011. Data about hydrogeological hazard are extrapolated by Trigila et al., 2015¹⁴

¹⁴ For further details, see notes 1 and 2.

Table 1A provides detailed data about cities and population exposed to hydrogeological and seismic hazards. Table 1B offers disaggregated data for each major municipality and metropolitan city. The map illustrates the geographical distribution of the results, making also feasible a visualization of the overlaps existing among different hazard in the same urban context (Fig. 1).

	MEDIUM / HIGH SEISMIC RISK		VERY HIGH / HIGH LANDSLIDE RISK		HIGH FLOOD RISK	
	Inhabitants (% of population in municipalities at risk)	% of residential building stock pre-1970	Population in areas at risk (% on the total)	% of urbanized surfaces in areas at risk	Population in areas at risk (% on the total)	% of urbanized surfaces in areas at risk
Rome	2.617.175	53%	375 (0,01%)	0,01%	21.102 (0,8%)	2,7%
Rome Metrop. City	3.576.655 (89%)	37%	18.926 (0,5%)	0,6%	40.644 (1%)	2,3%
Milan	-	-	-	-	29.711 (2,4%)	2,4%
Milan Metrop. City	-	-	-	-	43.703 (1,4%)	1,3%
Naples	962.003	68%	45.943 (4,8%)	3,3%	226 (0,02%)	0,1%
Naples Metrop. City	2.793.510 (91%)	46%	101.000 (3,3%)	3,3%	28.817 (0,9%)	0,9%
Turin	-	-	530 (0,1%)	0,1%	1.350 (0,2%)	0,4%
Turin Metrop. City	-	-	29.772 (1,3%)	3,2%	31.142 (1,4%)	2,9%
Palermo	657.561	66%	5.663 (0,9%)	1,9%	8.394 (1,3%)	1,3%
Genoa	-	-	29.769 (5,1%)	6,9%	49.165 (8,4%)	6%
Genoa Metrop. City	-	-	68.734 (8%)	14,7%	86.658 (10,1%)	5,7%
Bologna	-	-	412 (0,1%)	0,6%	3.964 (1,1%)	1,2%
Bologna Metrop. City	148.890 (15%)	11%	15.664 (1,6%)	4%	92.211 (9,4%)	13,6%
Florence	-	-	1.570 (0,4%)	0,5%	12.121 (3,4%)	3,3%
Florence Metrop. City	86.357 (9%)	11%	22.186 (2,3%)	4,5%	51.051 (5,2%)	4,6%
Bari	-	-	339 (0,1%)	0,1%	1.506 (0,5%)	1%
Bari Metrop. City	-	-	3.635 (0,3%)	0,1%	14.827 (1,2%)	1,5%
Catania	293.902	69%	213 (0,1%)	0,04%	480 (0,2%)	2,7%
Venice	-	-	-	-	55.650 (21,3%)	8,4%
Venice Metrop. City	-	-	-	-	135.381 (16%)	13,9%
Verona	-	-	-	-	12.338 (4,9%)	3,4%
Messina	243.262	64%	697 (0,3%)	0,5%	1516 (0,6%)	0,8%
Padua	-	-	-	-	38.358 (18,6%)	16,5%
Trieste	-	-	534 (0,3%)	0,2%	103 (0,1%)	0,2%
Taranto	-	-	-	-	81 (0,04%)	1,4%
Reggio di Calabria Metropol. City	550.967 (100%)	59%	14.033 (2,5%)	2%	16.581 (3%)	4,2%

Tab. 1B Disaggregated data about Italian major cities and metropolitan cities

Cities and Hazards

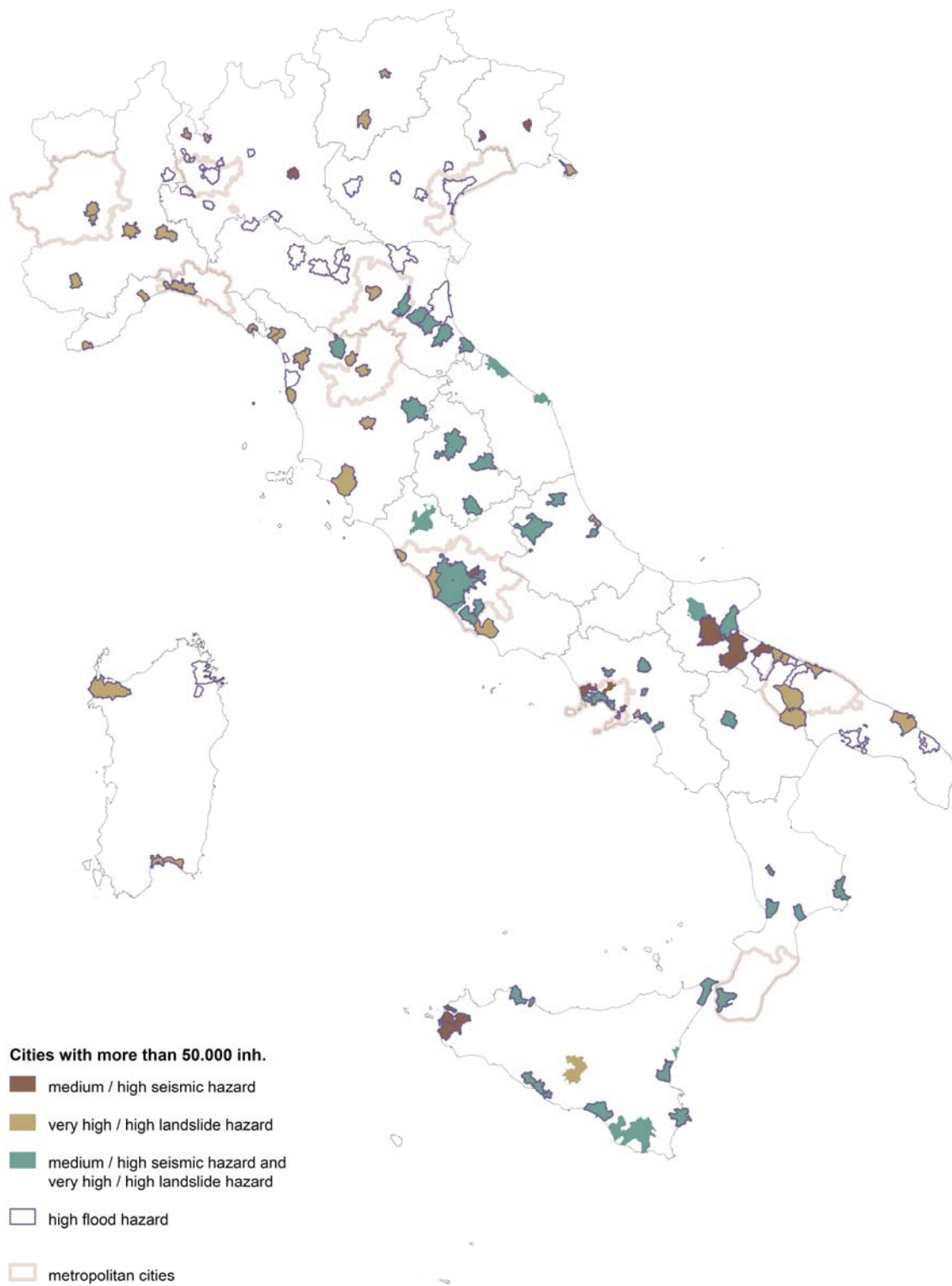


Fig. 1 Municipalities with more than 50.000 inhabitants, with high hydrogeological and seismic criticalities (elaborated by the author)

4 THE ROLE OF PLANNING

Research on risk reduction has recognised the role of regional and urban governance and planning in influencing the levels of risks, reducing or exacerbating natural hazards through infrastructural and technological measures, specific urban design technics, building codes, land-use plans etc. (Cremonini & Galderisi, 2007; Esteban et al., 2011; Fera, 1991; Menoni, 2005).

Given the levels of risk of Italian cities and metropolis clarified above, and the role of human activities in influencing such levels, the paper focus on how the reduction of seismic and hydrogeological risks is framed in Italian urban planning system.

Recognizing in legislation an element of risk governance (Esteban et al., 2011), a synthetic reconstruction of national and regional planning legislation has been carried out.

4.1 NATIONAL LEGISLATIVE FRAMEWORK

With reference to Italian history, many calamities have given birth to accusations of failures in territorial governance, leading towards new laws (or revisions of existing ones) in the direction of stricter rules and standards. First principal laws addressing the problem of stability of urban centres date back to the first decade of '900 (L. 445/1908; R.D. 193/1909); these acts introduced rules for the consolidation of landslides threatening villages, for the transfers of settlements and the prohibition of new constructions upon unstable lands.

The current national law on urban planning, promulgated in 1942 (L. 1150/1942), was modified and integrated in 1967 to achieve a larger control on urban development.

This legislative reform was influenced by the catastrophic events of 1966: the landslide in Agrigento and the floods in northern and central Italy (L. 765/1967).

In between the '70s and '80s, the relationship between seismic and hydrogeological risks and planning activities became direct, introducing special technical standards to build in seismic zones and requiring geomorphological judgements for urban plans (judgements necessary both to verify existing plans, both to adopt new ones) (L. 64/1974; L. 741/1981; D.M. 11 marzo 1988)¹⁵.

The flood of Florence gave birth to twenty-year work of the De Marchi Commission, which introduced a national program of interventions and criteria for land protection and led to the law for land defence in 1989 (L. 183/1989)¹⁶.

This law represented the first attempt to introduce an integrated approach among soil, water and planning, through "basin management plans"; this act was not effectively applied until the end of '90s, when the landslides in Sarno (1998) and the flood in Soverato (2000) led to the rapid enactment of laws both for the prevention of hydrogeological risk (imposing a national mapping of landslide risk), both for the implementation of basin management plans (L. 267/1998; L. 365/2000).

The indications given through these plans prevail on local urban plans.

After the earthquake in Umbria and Marche, a most appropriate concept of anti-seismic prevention has been imposed, not limited to the buildings but extended to urban centres¹⁷; after the earthquake in Molise, the technical

¹⁵ The law 64/1974 imposed a verification of geomorphological compatibility of new town plans for municipalities belonging to seismic zones; after Irpinia's earthquake, the law 741/1981 attributed to Regions the power to establish rules and criteria for the update of existing planning instruments.

¹⁶ The Environmental Code (L. 152/2006) unifies the legislation about land defence incorporating also the European Directive on water (2000/60/EC), while the European Floods Directive (2007/60/EC) has been implemented in 2010 (D.Lgs. 49/2010). The last one proposes a more comprehensive policy addressing flood risk, considering structural measures aimed at hazard control, but also vulnerability reduction.

¹⁷ The law 61/1998 tried to introduce integrated programs of recovery aimed at rehabilitation and recovery of towns hit by earthquakes or exposed to hydrogeological hazards. Umbria regional law on planning is one of the most advanced in Italy, as detailed below.

building codes and the national seismic zoning of the territory were updated (O.P.C.M. 3274/2003), stating that the nature of the soil affects the seismic motion, influencing local seismic risk.

The same regulation imposed a revision for the town plans of municipalities which seismic classification was changed. In September 2008, guidelines for seismic micro-zoning were defined with the purposes of contributing to local knowledge and of reducing seismic risk providing criteria for planning (ANCE & CRESME, 2012; Ghirelli, 2014; Gisotti, 2012).

After Abruzzo's earthquake, special funds have been designated to a national plan for the prevention of seismic risk, and the national civil protection is in charge of the application of the law (L. 77/2009): in such process, the ordinance of the Chief of National Civil Protection n°52/2013 added the analysis of C.L.E. "Limit Condition for Emergency" as a compulsory examination to be joined to micro-zoning.

The study of C.L.E. is dedicated to strategic buildings and infrastructures, in order to achieve greater integration among intervention aimed at reducing seismic risk. The regulatory framework is summarized by Fig. 2.

4.2 REGIONAL LEGISLATIVE FRAMEWORK

Since the early '70s, several reforms dedicated to administrative functions and local governance have taken place in Italy: a crucial change in the system is recognizable in the concurrent legislative power on territorial governance conferred to Regions by the reform of the Title V of the Constitution in 2001¹⁸.

Therefore, urban planning is regulated also at the regional level according to laws, principles and practices specific for each Region. By laws 64/1974 and 741/1981, Regions had to define rules and criteria to prevent seismic risks both for future town plans and detailed plans, both for the update of the existing ones.

The implementation carried on by Regions has been criticized, because of temporal delay in the enactment or the weakness of contents not able to influence urban planning (Menoni, 2005).

Otherwise, some of the most recent regional regulations have been able to better correlate prevention, risk reduction and design of planning tools (Monaco & Monaco, 2012).

The author developed a first examination of regional laws, focusing both on general laws on planning, both on specific laws on natural risks.

Analysing the principles stated, different approaches to risk reduction can be distinguished: only few Regions make no reference to the concepts of natural hazards or risks in their general laws on the government of territory (as the cases of Abruzzo, Lazio, Marche, Puglia, Sardinia).

In the majority of Italian Regions, basilar principles and notions on these themes have been metabolized from overriding national laws and debates, consequently achieving space in local laws on the government of territory (as the cases of Liguria and Piedmont¹⁹) or adopting specific regulations influencing local planning system (as the cases of Abruzzo²⁰, Marche, Molise, Puglia, Sicily, Valle d'Aosta).

Eight Regions out of twenty have clearly defined the reduction of risk as one of the focal objectives of territorial and urban planning in their main legislative framework: Calabria, Campania, Emilia-Romagna, Lombardy, Autonomous Provinces of Bolzano and Trento, Tuscany, Umbria, Veneto. Table 2 offers a synthetic overview of the regional framework.

¹⁸ The 2001 reform has brought to a division and partial overlay of competences about planning and environmental protection among different public bodies (L.C. 3/2001).

¹⁹ The L.R. 56/1997 has been updated by the L.R. 3/2013, inserting references to co-planning activities, due to the necessity of cooperation with the Agency of the management of Po river basin. The Region has adopted also two specific deliberations about planning, seismic prevention and land defence.

²⁰ According to the L.R. 28/2011 of Abruzzo, art.3: the instruments of regional and urban planning contribute to seismic risk reduction, through analysis of hazard, vulnerability and exposure, and addressing the locational choices and processes of urban transformation in accordance with criteria of prevention and mitigation of seismic risk. The contents of the emergency plans are received in the municipal urban planning tools.

Main catastrophic events and principal national laws on planning and risk reduction

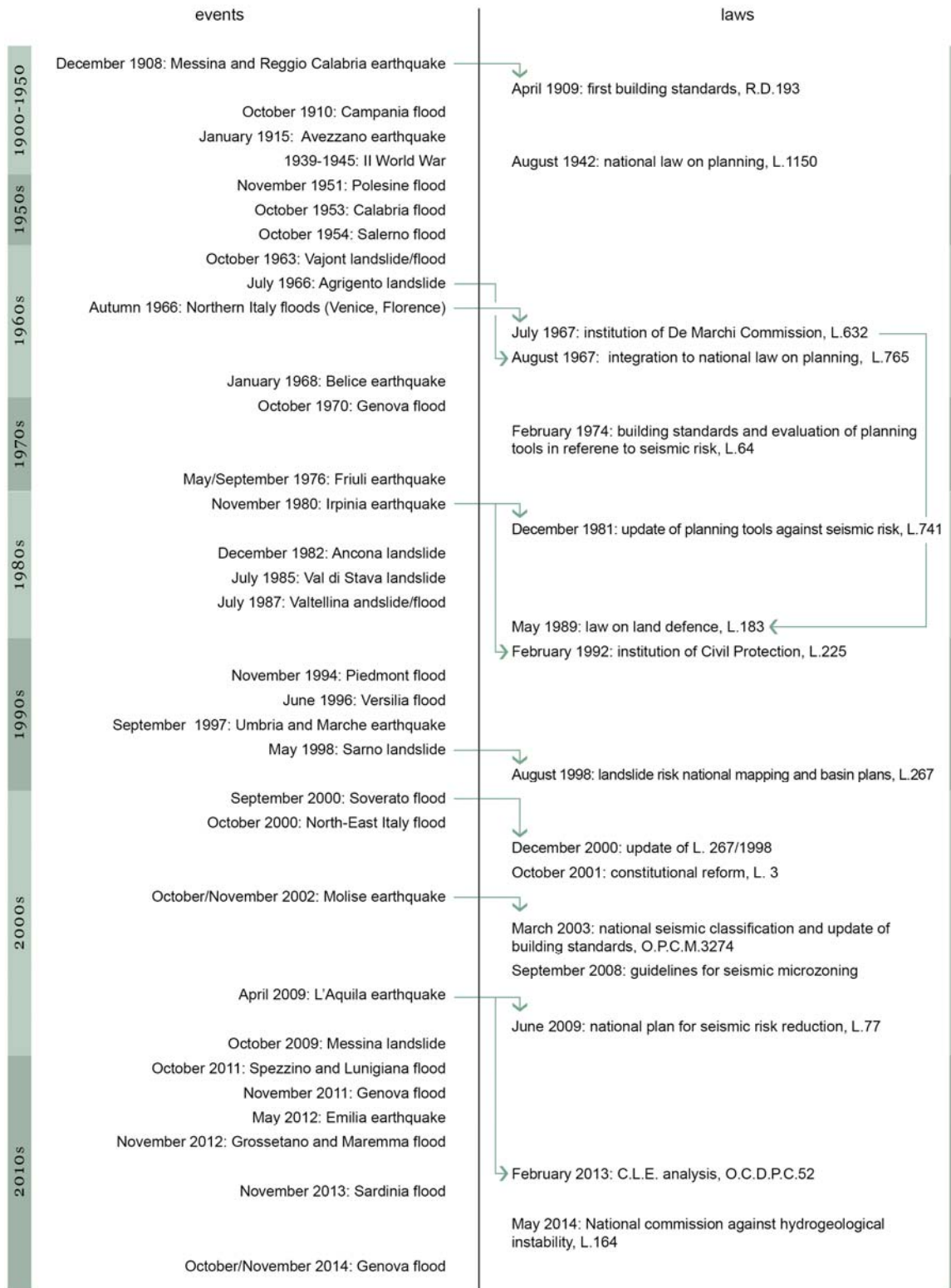


Fig. 2 Main catastrophic events in Italy since the beginning of XX century, and the regulatory framework influencing risk reduction and planning. Arrows indicate direct relations between events and promulgation of law

	REGIONAL LAW ON GOVERNMENT OF TERRITORY	REGIONAL SPECIFIC LAWS FOR RISK REDUCTION
Abruzzo	18/1983	28/2011
Basilicata	23/1999	38/1997; 25/1998
Calabria	19/2002	35/2009
Campania	16/2004	9/1983; 21/2003
Emilia-Romagna	20/2000	19/2008
Friuli-Venezia Giulia	5/2007	16/2009
Lazio	38/1999	4/1985
Liguria	36/1997	29/1983
Lombardy	12/2005	<i>abolished by the general regional laws</i>
Marche	34/1992	33/1984; 22/2011
Molise	-	15/1986; 25/2011
Piedmont	56/1977	19/1985; Regional Resolutions 540/2012 and 64/2014
Puglia	20/2001	Regional Resolutions 1328/2007 and 2753/2010
Sardinia	45/1989	-
Sicily	- (<i>temporal law: 71/1978</i>)	Regional Circular 2222/1995
Tuscany	65/2014	<i>abolished by the general regional laws</i>
Trentino-Alto Adige	Prov. Bolzano: L.P. 13/1997	Provincial Resolution 712/2012
	Prov. Trento: LP. 15/2015	DPR 15.01.2006
Umbria	1/2015	<i>abolished by the general regional laws</i>
Valle d'Aosta	11/1998	Regional Resolutions 2939/2008
Veneto	11/2004	Regional Resolutions 1841/2007 and 3308/2008

Tab. 2 List of regional laws on government of territory and examples of regional specific laws for risk reduction influencing planning (the laws indicated are in force at the moment of writing)

Some examples from the most interesting regional laws follow.

According to the regional law 19/2002 of Calabria, the Structural Municipal Plan regulates land use in relation to the assessment of the condition of landslide risk and local seismic hazard, and defines the areas necessary for the Civil Protection Plan (art. 20). The regional law 65/2014 of Tuscany requires both verifications on hazards related to hydrogeological aspects, coastal dynamics and seismicity during the design and updates of plans, both identification of the conditions that ensure the viability of the transformation proposed.

The law requires to update information about hazard and exposed areas after emergencies because they form the basis of regional and urban planning; the municipal plan of civil protection is an integral part of the town plan (art. 104). Umbria Region states that "anti-seismic discipline" is part of the activities involved in the government of territory at the art. 1 of its regional law on planning (L.R. 1/2015).

The town plan has to define architectural, functional and infrastructural elements (existing or planned) that constitute the "Minimal Urban Structure" (S.U.M.) whose efficiency has to be ensured for reducing urban seismic vulnerability (art. 21).

Veneto's regional resolution 3308/2008 stresses that in recent years "it is definitely gained the awareness of how seismic actions, combined with the design and construction of buildings not adequately compatible with the characteristics of the soil, make vulnerable both individual buildings and urban aggregations. For this reason, seismic issues have to be introduced in the procedures defined in the new regional planning framework, which has significantly changed the approach to urban planning".

This fragmented and complex legislative framework could be summarized from a temporal point of view: less recent regional laws on planning ignore issues about nature-driven risks, while laws defined or updates since the beginning of 2000s demonstrate a more advanced approach, closer to the debate about risk mitigation.

5 DISCUSSION

From the analysis of available data and legislative framework in force, the research highlights topics not adequately discussed in the debate about cities and risks and the different approaches and methods for reducing risks led by national and regional authorities.

5.1 MISSING ISSUES

The fragility of Italian territory is widely documented as shown by studies, reports and data available, as well as by dedicated national and local laws here summarized (among the others: (AA.VV., 2007, 2014; ANCE & CRESME, 2012; Guidoboni & Valensise, 2014; Ministero dell'Ambiente e della Tutela del Territorio e del Mare, 2008; Munafò et al., 2015; Trigila et al., 2015).

A deep knowledge about seismic and hydrogeological risks has been developed in Italy, and consequently rich and wide information. Nevertheless, missing elements and themes emerge, above all for what concerns urban systems. The availability of open-access data at local scale is only very recent²¹.

This represent a consistent weakness of the attention dedicated to the issue of nature-driven risks in cities, considering that about 33% of Italian inhabitants live in municipalities with more than 50.000 inhabitants. In the same way, data are generally referred to hazards, and not frequently to an evaluation of risk as the product of hazard, vulnerability and exposure.

For what concerns the legislative framework about seismic and hydrogeological risk reduction, the evaluation and mitigation of hazards have been included in the national and regional legislation, and the role of planning activities in challenging these risks is recognized. In the meantime, high vulnerability of Italian territory and cities to "natural" hazards is demonstrated both by data, both by the ruinous effects of earthquakes and recurrent floods and landslides, as summarized by the chronology in Fig. 2.

To analyse the reasons of the state of decay of the territory is not the purpose of this study, but some considerations can be sketched. As Casagli and Menoni recognized, problems of inadequate implementation of the cited legislative frameworks, from a qualitative and/or quantitative point of view, can be a partial answer to Italian territorial fragility in its physical, social, economic and political aspects (Casagli, 2012; Menoni, 2005, p. 161).

This wide legislative framework has not efficiently influenced planning choices and collective history, and the upgrades in the normative systems have not triggered appropriate connection and coordination between laws and operational tools despite the regulatory constraints²².

²¹ As discussed before, only last ISPRA report n°233 offers an open-access dataset from which extrapolating data about cities. Generally, data are accessible only at regional or provincial scale.

²² For instance, the building regulation is dedicated mainly to reduce seismic risk and contains very few norms in terms of building resilience to hydrological processes. Many analysis, such as geological or seismic studies, were imposed more as formal acts than as actual bound conditions for planning strategies for land use. Soil stability is not affected only by new urbanization but also by many other ordinary interventions in the cities; consequently,

Risk reduction struggles to go beyond fragmented interpretations, regulations and plans, that debate about it as a topic in unstable balance between civil protection, planning and environmental protection²³. An effective reduction of risks through planning is a systemic strategy, that takes into consideration the effects of territorial transformations on physical, functional, social and economic pillars of cities (Biondi, Fabietti, & Vanzi, 2011)²⁴.

Even if interconnections between “sector plans” and “general planning” are present at an early stage in the latest regional laws, they emerge clearly only in post-disaster reconstruction plans or programs (Monaco & Monaco, 2012), when integrating technical and political choices is likely recognised as the favoured strategy to reduce risks, maximise efforts and decrease costs²⁵.

The crisis of planning (Benevolo, 2012) and the pervasive phenomenon of illegal urban development²⁶ are well-known and have to be added to these issues, as well as the weakness of control activities, the inadequate expenditure for activities dedicated to prevention and reduction of existing risks (Amanti, 2014; Menoni, 2005).

The overlaps among different institutions and subjects appointed in activities of risk reduction can have led to a counterproductive fragmentation of roles and tools.

Furthermore, the research highlights also how these themes are not even present in some cases, as demonstrated by absent or obsolete regional laws on planning, or by a not sufficient debate at the national level.

5.2 NATIONAL AND REGIONAL POWERS

In the last years, legislative changes occurred at the national level, influencing the planning system too. The Italian parliament is discussing a bill for a new reform of the Italian Constitution (after the mentioned 2001 reform) at the moment of writing (DdL. 1429-D, 20th January 2016).

According to this proposal, “the general norms about the government of the territory and the national system of civil protection” will return to be subjects of the exclusive legislative power of the State.

The process is ongoing, but the proposal let arise many questions about if and how this change will affect local planning systems in all their aspects, which are deeply different in every Region, as showed through the previous examinations. Going back to the national law on urban planning (L. 1150/42), several proposals of reform have been suggested without accomplishment; the last one promoted in July 2014²⁷ was mainly a fiscal proposal, without any reference to broader meanings and roles of planning.

On the contrary, planning is largely recognized by the academic and scientific debate as a discipline characterized by a holistic and proactive approach and involved in the overall government of cities, urban environment and landscape (Davoudi, 1999; Secchi, 2000), as proved by recent regional laws. Consequently, no reference is made in this proposal about the role of public territorial policies and urban transformation in the reduction of risks. The national debate on planning seems to lag behind the regional ones.

geological studies at the base of a reliable local planning cannot be only analytical, but must be referred to new uses and projects proposed.

²³ For example, the necessity of the spatial organization of civil protection and emergencies could be included in land use decisions, to regulate consistently the design of planning instruments.

²⁴ Existing studies on the use of “Minimal Urban Structure” and “Limit Condition for Emergency” as categories for planning are examples (Fabietti, 2013; Olivieri, 2013).

²⁵ For further readings about the role of urban planning in post-disaster reconstruction in Italy, among the others: Caravaggi, Carpenzano, Fioritto, Imbroglini, & Sorrentino, 2013; Clementi & Di Venosa, 2012; Olivieri, 2004.

²⁶ According to Legambiente and CRESME, between 1998 and 2003 the medium percentage of not legal buildings is about 30% of total heritage (Legambiente, 2008, as cited by Destro, 2013, p. 83).

²⁷ “Principles for territorial public policies and urban transformation”, promoted by the Ministry of Infrastructures and Transports.

5.3 REACTIVE AND PROACTIVE APPROACHES

Examining the normative evolution, it's possible to affirm that Italian regulations propose an approach to the reduction of urban risks that can be described as still partially "reactive"²⁸ both at national and local level. The relation between urban planning and reduction of risk emerging from laws seems based on assessments of compatibility between proposals of future urban transformation and hydrogeological and seismic characteristics of the territory, assuming the knowledge of hazards and potential risks as a guide in designing planning.

This reactive approach has been traditionally predominant, even if in different forms. Regarding seismic risk, because of the impossibility of reducing the hazard, the reduction of vulnerability has been mainly delegated to an increase of structural resistance of buildings and infrastructures to hazards. On the contrary, regarding hydrogeological risks, the main approach has been the reduction of hazards when possible, such as intervening on hydrographic systems or on unstable areas.

In both cases, the main strategy was delegated to engineering technologies, standards, regulations, almost considering exposure as "irreducible".

Without denying the fundamental role of these methods, poor references to strategic and systemic approaches and to the spatial context represent recognized weaknesses (Cremonini & Galderisi, 2007). Surprisingly, examples of "reactive approach" can be found also in recent laws that in general propose more advanced positions on the theme, such as in Veneto's regional resolution 1841/2007 about hydrogeological risk: "Increased human pressure on natural resources often *forces to plan urban development in areas with high geological risk, thus forcing to tackle risks ever higher* [...] It's very important to demonstrate that new planning forecasts will not aggravate *the existing level of flood risk, nor will compromise the possibility of reducing that level* [...] the assessment of hydrogeological compatibility may also provide measures for risk mitigation, indicating their effectiveness in *reducing the hazard*" (translation of the author, italic added).

Other Regions propose a different attitude.

For instance, Umbrian regional law (L.R. 1/2015) imposes that new settlements proposed by town plans cannot use areas in the presence of a significant risk of flooding or landslides, in order to guarantee a sustainable land use; it also prescribes objectives and tools for the reduction of seismic urban vulnerability in town plans, integrating de facto prevention and planning activities²⁹. Similarly, in Emilia Romagna (L.R. 20/2000) the structural town plan has to set out actions to eliminate or reduce the level of risk in existing settlements.

In territories characterized by hydrogeological instability, hydraulic danger or avalanches, only recovery interventions on existing buildings are allowed, while new constructions and land use changes that can augment the exposure to risk are prohibited.

These approaches can be read as steps towards pro-active ones, that look at the reduction of risk as a combination of activities to reduce hazards, vulnerabilities and exposure, with reference to cities as complex systems, not addressing single aspects.

Enlarging these reflections towards prevention activities, it is necessary an annotation about the relationship between urban planning and the activities of prevention and emergency management, carried out by the Civil Protection mostly.

This relationship is ruled by the national law (L. 225/1992) but also at the local level: generally, civil protection activities should be harmonized with the programs for territorial protection and recovery.

²⁸ Reactive approaches are defined as feedback-driven, based on resistance to changes. Proactive approaches are feedforward-driven, based on anticipation and adaptation. For further reading, among the others: Godschalk, 2003; Hollnagel et al., 2006; Klein, Nicholls, & Thomalla, 2003.

²⁹ Umbria Region is considered exemplar for its attention to these issues after 1998 earthquake, for instance for its L.R. 61/1998 and its previous regional law on planning (L.R. 11/2005) (Di Salvo, Giuffrè, Pellegrino, & Pizzo, 2012).

A recent reform of Civil Protection System (L. 100/2012) has overturned this notion, imposing to the plans involved in government and protection of the territory to be coordinated with the emergency plans of civil protection, above all with local ones (art. 3).

For instance, Tuscany and Calabria's regional law on planning confer to town plans the contents and efficacy of emergency plans too; consequently, every update due to emergencies or to ruinous events constitute a direct variation of the town plans³⁰.

In the meantime, in the last twenty years the national expenditure for activities dedicated to prevention amounts to the 40% of the costs incurred to repair damages, less than the 1% of the expenditure potentially needed for a full recovery from the same events (Amanti, 2014)³¹.

The shift from mitigation of risk to systematic reduction and adaptation to it is still at a first stage in the national debate, contrary to the international wide debate that fostered the diffusion of the concept of "urban adaptation" to risks, mainly inherited by the considerations about the notions of "urban resilience" and "climate change adaptation" (Biesbroek, Swart, & Van der Knaap, 2009; Davoudi et al., 2009)³².

Besides, how to reduce risks and intervene on existing urban fabrics exposed to existing risks (and commonly built in dissimilarity to regulations), is a not raised question, which instead represents one of the most delicate and hard aspects of the theme.

As every process of urban transformation in built contexts, the reduction of risks have to be carried out through cross-sectorial activities (for instance, adaptation of housing stocks and infrastructures, urban retrofitting aimed at the recovery of open spaces, building redundant paths, changing uses and locations), confronting the necessity of transformation with inherited uses and activities, historical values and social significances of the city (Casagli, 2012; Fera, 1991; Lazzari, 1988; Monaco & Monaco, 2012).

6 CONCLUSION

Seismic and hydrogeological risks stress Italian territory, as showed by national and regional reports, events, thematic data. Through a selection of available data and an original extraction and synthesis of information from official reports, the paper proposes a synthetic profile of Italian cities and metropolis at seismic and landslide risk, to underline the wide dimension of the phenomenon.

Risk reduction can be a variable of planning, as recognized by the current scientific debate (Cremonini, 2009; Cremonini & Galderisi, 2007; Fera, 1991; Menoni, 2005; Menoni & Margottini, 2011) and given the increased awareness of the role of human activities in the genesis of disasters (Ambraseys & Bilham, 2011; Steinberg, 2000).

The review carried out by this research shows how the reduction of "natural" risks through planning has been influenced by catastrophic events, and how it is framed in national and regional normative frameworks, given that territorial governance is framed as a concurrent legislative power between State and Regions.

The paper highlights interesting recent steps towards more pro-active approaches as deducible by recent regional laws as Umbria's. Nevertheless, the fragility of the territory demonstrates the limits of these attempts, as suggested by the difficulties in fostering regular and systematic risk reduction policies, and in strengthening ordinary tools of land defence.

³⁰ In this sense, the introduction of the analysis of "Limit Condition for Emergency" mentioned previously can contribute to a deeper relation between planning, reduction of risk and civil protection activities.

³¹ Use of "states of emergency", and the related active role of Civil Protection, is often controversial: the declaration of a state of emergency allows to exceed ordinary regulations, such as general laws on public works.

³² Adaptation is a complex capacity, focused on adjusting systems to moderate the impact of potentially ruinous events; for instance, it can take the shape of reducing dependence on vulnerable systems, of decreasing sensitivity and exposure, of strengthening existing elements (Adger, Huq, Brown, Conway, & Hulme, 2003).

There is not a deep acknowledgement of risk reduction as a “public good” yet, as well as of the common relevant points shared by the purposes of reducing risks.

An effective land defence is a system of integrated policies addressed to long-term use and management of the territory, and not only to reduction of land consumption.

The government of territory should not be focused on introducing new restrictions or tools, but on coordinating existing ones in new and comprehensive integrated frameworks based on urban multi-risk analysis.

The role of planning as an ordinary tool of land defence has not been strengthened; it doesn't seem able to shift urban development and design towards new paths, while to perpetuate “Weick's non-event” requires constant effort.

REFERENCES

AA.VV. (2007). *Rapporto sulle frane in Italia. Il Progetto IFFI – Metodologia, risultati e rapporti regionali*. (78/2007). APAT.

AA.VV. (2014). *Qualità dell'ambiente urbano. X Rapporto*. (53/2014). ISPRA.

ANCE, & CRESME. (2012). *Lo stato del territorio italiano 2012. Insediamento e rischio sismico e idrogeologico*.

Casagli, N. (2012). *25 ottobre 2011: Magra e Cinque Terre*. Paper presented at the Incontro-dibattito Cosa non Funziona nella Difesa dal Rischio Idro-Geologico nel Nostro Paese? Analisi e Rimedi., Roma, Accademia Nazionale dei Lincei.

Destro, N. (2013). *Geografia delle case deboli. Oltre l'abusivismo edilizio*. (Doctoral thesis), Università degli Studi di Padova: Dipartimento di Scienze Storiche, Geografiche e dell'Antichità. Retrieved from <http://paduaresearch.cab.unipd.it/5665/>

Di Salvo, G., Giuffrè, M., Pellegrino, P., & Pizzo, B. (2012, 10-11 May). *Prevenzione e ricostruzione per la riduzione del rischio sismico*. Paper presented at the L'Urbanistica che cambia. Rischi e valori. XV Conferenza Nazionale della Società Italiana degli Urbanisti, Pescara.

IPPC. (2012). *Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of working groups I and II of the intergovernmental panel on climate change*. (2012). Cambridge and New York: IPPC.

Legambiente. (2008). *Rapporto Ecomafia 2008. I numeri e le storie della criminalità ambientale*. (2008). Milano:

Ministero dell'Ambiente e della Tutela del Territorio e del Mare. (2008). *Il rischio idrogeologico in Italia*.

Munafò, M., Assennato, F., Congedo, L., Luti, T., Marinosci, I., Monti, G., . . . Marchetti, M. (2015). *Il consumo di suolo in Italia*. (218/2015). Roma: ISPRA.

OECD. (2012). *Redefining "Urban". A new way to measure metropolitan areas*. (2012). OECD Publishing.

Trigila, A., Iadanza, C., Bussetini, M., Lastoria, B., & Barbano, A. (2015). *Dissesto idrogeologico in Italia: pericolosità e indicatori di rischio. Rapporto 2015*. (233/2015). Roma: ISPRA.

UN World Commission on Environment and Development. (1987). *Our Common Future*. (1987). United Nations.

Adger, N. W., Huq, S., Brown, K., Conway, D., & Hulme, M. (2003). Adaptation to climate change in the developing world. *Progress in development studies*, 3(3), 179-195. doi:<http://dx.doi.org/10.1191/1464993403ps0600a>

Alexander, D. E. (2014). I disastri nel mondo: quale futuro? In E. Guidoboni & G. Valensise (Eds.), *L'Italia dei disastri. Dati e riflessioni sull'impatto degli eventi naturali 1861-2013* (pp. 415-430). Bologna: Bononia University Press.

Amanti, M. (2014). Frane: la fragilità del territorio italiano. In E. Guidoboni & G. Valensise (Eds.), *L'Italia dei disastri. Dati*

- e riflessioni sull'impatto degli eventi naturali 1861-2013* (pp. 159-190). Bologna: Bononia University Press.
- Ambraseys, N., & Bilham, R. (2011). Corruption kills. *Nature*, 469(7329), 153-155. doi:http://dx.doi.org/10.1038/469153a
- Benevolo, L. (2012). *Il tracollo dell'urbanistica italiana*. Roma: Laterza.
- Biesbroek, G. R., Swart, R. J., & Van der Knaap, W. G. M. (2009). The mitigation–adaptation dichotomy and the role of spatial planning. *Habitat International*, 33(3), 230-237. doi:http://dx.doi.org/10.1016/j.habitatint.2008.10.001
- Biondi, S., Fabietti, V., & Vanzi, I. (2011). Modelli di valutazione per la vulnerabilità sismica urbana. *Urbanistica*(147), 89-99.
- Caravaggi, L., Carpenzano, O., Fioritto, A., Imbroglini, C., & Sorrentino, L. (2013). *Ricostruzione e governo del rischio. Piani di Ricostruzione post-sisma dei Comuni di Lucoli, Ovindoli, Rocca di Cambio e Rocca di Mezzo (L'Aquila)*. Macerata: Quodlibet.
- Clementi, A., & Di Venosa, M. (Eds.). (2012). *Pianificare la ricostruzione: sette esperienze dall'Abruzzo*. Venezia: Marsilio.
- Cremonini, I. (2009). Gli urbanisti e la prevenzione sismica. *Urbanistica INFORMAZIONI*, 226, 11-13.
- Cremonini, I., & Galderisi, A. (2007). Rischio sismico e processi di piano: verso l'integrazione. *Urbanistica*, 134, 7-12.
- Davoudi, S. (1999). Sostenibilità: una nuova visione per il sistema britannico di pianificazione. *Urbanistica*, 112, 78-82.
- Davoudi, S., Crawford, J., & Mehmood, A. (Eds.). (2009). *Planning for climate change: strategies for mitigation and adaptation for spatial planners*. London: Earthscan.
- Esteban, J. F., Izquierdo, B., Lopez, J., Molinari, D., Menoni, S., De Roo, A., . . . Eftichidis, G. (2011). Current Mitigation Practices in the EU. In S. Menoni & C. Margottini (Eds.), *Inside Risk: a strategy for sustainable risk mitigation* (pp. 129-186). Milano: Springer-Verlag Italia.
- Fabietti, V. (2013). Dalla CLE alla SUM: i contenuti urbanistici della protezione dai rischi. *Urbanistica DOSSIER*, 130, 38-39.
- Fera, G. (1991). *La città antisismica: storia, strumenti e prospettive della pianificazione territoriale per la riduzione del rischio sismico*. Roma: Gangemi.
- Ghirotti, M. (2014). Grandi frane: disastri e processi del Novecento. In E. Guidoboni & G. Valensise (Eds.), *L'Italia dei disastri. Dati e riflessioni sull'impatto degli eventi naturali 1861-2013* (pp. 73-98). Bologna: Bononia University Press.
- Gisotti, G. (2012). *Il dissesto idrogeologico: previsione, prevenzione e mitigazione del rischio*. Palermo: Flaccovio.
- Godschalk, D. R. (2003). Urban hazard mitigation: creating resilient cities. *Natural hazards review*, 4(3), 136-143. doi:http://dx.doi.org/10.1061/(ASCE)1527-6988(2003)4:3(136)
- Guidoboni, E. (2014). Terremoti e città. In E. Guidoboni & G. Valensise (Eds.), *L'Italia dei disastri. Dati e riflessioni sull'impatto degli eventi naturali 1861-2013* (pp. 243-278). Bologna: Bononia University Press.
- Guidoboni, E., & Valensise, G. (2014). *L'Italia dei disastri. Dati e riflessioni sull'impatto degli eventi naturali 1861-2013*. Bologna: Bononia University Press.
- Hollnagel, E., Woods, D. D., & Leveson, N. (Eds.). (2006). *Resilience Engineering: Concepts and Precepts*. Aldershot: Ashgate Publishing Limited.
- Klein, R. J. T., Nicholls, R. J., & Thomalla, F. (2003). Resilience to natural hazards: How useful is this concept? *Environmental Hazards*, 5, 35-45. doi:http://dx.doi.org/10.1016/j.hazards.2004.02.001
- Latour, B. (1991). *Nous n'avons jamais été modernes* (G. Lagomarsino, Trans. (2015). *Non siamo mai stati moderni*. Eleuthera Ed.). Paris: Editions La Découverte.
- Lazzari, S. (1988). Norme e tecniche sulla pianificazione urbanistica in aree franose. In P. Canuti & E. Pranzini (Eds.), *La*

gestione delle aree franose (pp. 243-272). Roma: Edizioni delle autonomie.

Menoni, S. (2005). *Costruire la prevenzione: strategie di riduzione e mitigazione dei rischi territoriali*. Bologna: Pitagora.

Menoni, S., & Margottini, C. (Eds.). (2011). *Inside Risk: a strategy for sustainable risk mitigation*. Milano: Springer-Verlag Italia.

Menoni, S., Margottini, C., Galderini, A., Delmonaco, G., Ferrara, F., Kropp, J., . . . Plebani, P. (2011). Shift in thinking. In S. Menoni & C. Margottini (Eds.), *Inside Risk: a strategy for sustainable risk mitigation* (pp. 286-327). Milano: Springer-Verlag Italia.

Monaco, A., & Monaco, R. (2012). *Urbanistica, edilizia e rischio sismico* (2 ed.). Napoli: Simone.

Olivieri, M. (2004). Regione Umbria. Vulnerabilità urbana e prevenzione urbanistica degli effetti del sisma: il caso di Nocera Umbra. *Urbanistica DOSSIER*, 44.

Olivieri, M. (2013). Dalla SUM alla CLE: strategie a confronto per la sicurezza degli insediamenti. *Urbanistica DOSSIER*, 130, 34-37.

Paul, B. K. (2011). *Environmental hazards and disasters: contexts, perspectives and management*. Chichester: John Wiley & Sons.

Pirlone, F. (2009). *I rischi naturali nelle prassi ordinarie di pianificazione e gestione urbanistica: l'importanza della territorialità nella sicurezza del territorio*. Firenze: Alinea.

Reddy, S. D. (2000). Examining hazard mitigation within the context of public goods. *Environmental management*, 25(2), 129-141.

Secchi, B. (2000). *Prima lezione di urbanistica*. Roma: Laterza.

Steinberg, T. (2000). *Acts of God: The unnatural history of natural disaster in america*. New York: Oxford University Press.

Legislation

L. 445, 9 luglio 1908, Legge concernente i provvedimenti a favore della Basilicata e della Calabria.

Regio Decreto 193, 18 aprile 1909, Norme tecniche ed igieniche obbligatorie per le riparazioni ricostruzioni e nuove costruzioni degli edifici pubblici e privati nei luoghi colpiti dal terremoto del 28 dicembre 1908 e da altri precedenti elencati nel R.D. 15 aprile 1909 e ne designa i Comuni.

L. 1150, 17 agosto 1942, Legge Urbanistica.

L. 765, 6 agosto 1967, Modificazioni ed integrazioni alla legge urbanistica 17 agosto 1942, n. 1150.

L. 64, 2 febbraio 1974, Provvedimenti per le costruzioni con particolari prescrizioni per le zone sismiche.

L. 741, 10 dicembre 1981, Ulteriori norme per l'accelerazione delle procedure per l'esecuzione di opere pubbliche.

D.M. 11 marzo 1988, Norme tecniche riguardanti le indagini sui terreni e sulle rocce, la stabilità dei pendii naturali e delle scarpate, i criteri generali e le prescrizioni per la progettazione, l'esecuzione e il collaudo delle opere di sostegno delle terre e delle opere di fondazione.

L. 183, 18 maggio 1989, Norme per il riassetto organizzativo e funzionale della difesa del suolo.

L. 225, 24 febbraio 1992, Istituzione del servizio nazionale della protezione civile.

L. 61, 30 marzo 1998, Conversione in legge, con modificazioni, del decreto-legge 30 gennaio 1998, n. 6, recante ulteriori interventi urgenti in favore delle zone terremotate delle regioni Marche e Umbria e di altre zone colpite da eventi calamitosi.

L. 267, 3 agosto 1998, Conversione in legge, con modificazioni, del decreto-legge 11 giugno 1998, n. 180, recante misure urgenti per la prevenzione del rischio idrogeologico ed a favore delle zone colpite da disastri franosi nella regione

Campania.

L. 365, 11 dicembre 2000, Conversione in legge, con modificazioni, del decreto-legge 12 ottobre 2000, n. 279, recante interventi urgenti per le aree a rischio idrogeologico molto elevato ed in materia di protezione civile, nonché a favore delle zone della regione Calabria danneggiate dalle calamità idrogeologiche di settembre ed ottobre 2000.

L.C. 3, 18 ottobre 2001, Modifiche al titolo V della parte seconda della Costituzione.

O.P.C.M. 3274, 20 marzo 2003, Primi elementi in materia di criteri generali per la classificazione sismica del territorio nazionale e di normative tecniche per le costruzioni in zona sismica.

L. 77, 24 giugno 2009, Conversione in legge, con modificazioni, del decreto-legge 28 aprile 2009, n. 39, recante interventi urgenti in favore delle popolazioni colpite dagli eventi sismici nella regione Abruzzo nel mese di aprile 2009 e ulteriori interventi urgenti di protezione civile.

D.Lgs. 49, 23 febbraio 2010, Attuazione della direttiva 2007/60/CE relativa alla valutazione e alla gestione dei rischi di alluvioni.

L. 100, 12 luglio 2012, Conversione in legge, con modificazioni, del decreto-legge 15 maggio 2012, n. 59, recante disposizioni urgenti per il riordino della protezione civile.

O.C.D.P.C. 52, 20 febbraio 2013, Attuazione dell'art. 11 del decreto legge 28 aprile 2009 n. 39, convertito, con modificazioni, dalla legge 24 giugno 2009, n. 77.

L. 56, 7 aprile 2014, Disposizioni sulle città metropolitane, sulle province, sulle unioni e fusioni di comuni.

DdL. 1429-D, 20 gennaio 2016, Disposizioni per il superamento del bicameralismo paritario, la riduzione del numero dei parlamentari, il contenimento dei costi di funzionamento delle istituzioni, la soppressione del CNEL e la revisione del titolo V della parte II della Costituzione.

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