

**Abstract**

Disaster hazard depends on both human population and potentially destructive agents. Thus, the vulnerability is strictly related to peculiarities of local areas such as the natural system, the social structure and the built environment. Urban planning and policies contribute to adapt territorial conditions to face natural disaster events, reduce social and physical disruptions. Indeed, the development of reconstruction policies is part of a broader goal that should aim to 'rebuild the community' while considering risk reduction actions and reconstruction plans according to the *build back better* approach. In this framework, the research focuses on the opportunity to rethink the importance of a resilient reconstruction process in contrast with the slavish reiteration of actions detached from the peculiarities of places, society and economic fabrics that mainly led the Italian post-earthquake initiatives. In order to do so, the paper addresses the ongoing recovery process on the island of Ischia hit by an earthquake in August 2017.

**Keywords:** reconstruction, community, post-disaster recovery, urban planning, scenarios

**Introduction**

In places where people have a strong bond with the territory, cultural roots and sense of belonging have a role in the risk perception that may weaken the hazard awareness [1]. Thus, people are willing to face natural risks by looking for new building solutions, adaptive measures and emergency prevention, avoiding moving to safer areas. Urban settlements that are affected by the presence of permanent conditions of risk have to deal with reconstruction matters when significant disaster events occur. In this perspective, the development of efficient reconstruction policies is part of a broader goal that should aim to 'rebuild the community'. For public institutions and urban planners this implies to develop post-disaster programs considering risk reduction actions and resilient reconstruction plans according to the *build back better* approach [2].

Post-earthquakes experiences of reconstruction in Italy have benefited from the collaboration of the different levels of post-emergency governance (state, regional, local) that implemented actions tailored to immediate and long-term people's needs. Nevertheless, by considering the lack of a homogenous regulatory and procedural national



Fig. 1. Island of Ischia. The municipalities of Casamicciola Terme and Lacco Ameno and the localization of the red areas.

framework for post-earthquake reconstruction processes, Italian cases have seen the slavish reiteration of a generic model, made up of resolutions and actions that have often been detached from peculiarities of places, landscape features and economic interests affected by the seismic event [3].

The research paper investigates, in the first paragraph, the role of the society in planning landscapes at risk in the frame of resilient post-disaster reconstruction. In the second part, it highlights the chance to define a range of reconstruction scenarios by taking into account the value that the local community gives to areas representative of their identity although places at risk. In the third section, the research study addresses the ongoing reconstruction process of part of the municipalities of Lacco Ameno, Casamicciola Terme and Forio, on the island of Ischia, in the Campania Region – hit by an earthquake on 21st August 2017 (Fig. 1). Specifically, the paper reports on the spatial plans' developing process of the municipalities of Casamicciola Terme and Lacco Ameno. The plans have been carried out by local institutions to face urban issues brought out by the earthquake, through a framework agreement

signed by the two municipalities and the Department of Architecture of the University of Naples Federico II<sup>1</sup>. The research study provided urban analysis and addressed reconstruction issues through a 'scenario building' methodology. Although the development procedures of the urban plans have not confronted the participatory phase yet, the research paper points out – through a focus on the theoretical background and the methodology applied – that the development of long- and short-term scenarios can become innovative tools to involve people and institutions in designing a resilient landscape through the reconstruction.

**A paradigm shift: the social construction of risk**

Risk is a widely present issue in public debates. Its interest has grown in scientific research together with communities due to a growing awareness of people's role in preventing and facing disasters affecting human and natural environments. However, early researches on risk were predominantly hazard-orientated and disaster risk was perceived as a sudden event, a direct consequence of natural hazards as the

expression *natural disaster* shows [4]. At the end of 1970s, pioneering studies by Reference [5] introduced the social dimension of risk as a research field whose concept reflected in the definition of risk that was developed during the meeting of the United Nations Disaster Relief Organization (UNDR0), in 1979. Therein, risk is defined through three components: natural hazards, elements at risk, and vulnerability. Thus, it was recognized that disasters result from the combination of multiple variables including the vulnerability of exposed elements and their physical, economic and environmental qualities. This definition was largely adopted in scientific studies and refined by the United Nations International Office for Disaster Risk Reduction in order to promote common understanding and definitions of risks [6]. Studies in the 2000s further investigated the factors of risk highlighting that they are influenced, and must be improved, by policies and plans of governments and disaster risk is an unresolved issue of development. Among these, United Nations Development Programme (UNDP) filled up a comparatively assess disaster risk between countries [7] and assessed that places are not equally exposed to natural hazards because of the role of vulnerability parameters such as poverty, underdevelopment, urban growth and deforestation. Moreover, natural disaster risk reduction has been recognized as a cross-cutting issue, an obstacle to the pursuit of various sustainability objectives: from eradicating poverty to climate change adaptation and building sustainable cities [8]. Nowadays, although worldwide countries have improved emergency tools and policies that lead to decreased deaths and injuries due to natural disasters, the losses affecting the built environment and the socio-economic sphere have been increasing [9] causing damage in the economic growth and making communities vulnerable.

The theory of vulnerability has evolved in many fields including structural engineering, geography, sociology [10] and ecology [11]. It is part of the paradigm shift towards the social construction of disasters and it is strongly connected to the shape and behaviour of settlements and communities affected by natural disasters. Resilience instead describes the capability of communities to react and recover by disaster events. It represents the flip side of vulnerability [12] but the two remain separate concepts, as some communities may be very vulnerable to the impact of a hazard while showing high levels of resilience in the response phase. In summary, both components depend on the triad territory, community and risk. Thus, resilient criteria can be achieved only by involving communities and citizens groups in the planning and development process, and by doing so, contributing to the goals of empowerment and democratization. As it acts on the conformation of territories, urban planning is central to impact vulnerabilities and resilience factors. The case of the island of Ischia shows how the lack of urban planning has led to increased vulnerability of both human settlement and community

undermining people's ability to participate in the reconstruction process. This is exacerbated by an unplanned landscape that led to conflicts between the spatial governance and the community's rights of inhabiting the island. Due to the unauthorised urbanization processes, started in the 1900s' [13], part of the local community is still suspended in the dimension of the informal housing. As a consequence, according to current state regulations, the right of access to the reconstruction subsidies is not equal for all the citizens, and this affects economic activities as well. Therefore, the research aims to develop an innovative 'scenario' method to face post-disaster reconstruction in complex environments, overcoming current obstacles to the effective involvement of the community by treating spatial rights and housing issues together, from the phase of the analysis to the design of scenario hypothesis as a base for a collective discussion on urban regeneration.

### **Living landscapes at risk: the importance of urban planning in pre- and post-disaster events**

Living in areas at risk has become an ordinary and unavoidable condition given the demographic pressure of seismic active areas, flood plains or areas prone to landslides. In most of the cases, forcing precautionary people displacement as a planning management choice is not considered a feasible option because of people's reluctance (due to a low perception of risk), and regional conditions such as overpopulation and density of the built environment in the metropolitan area. In this perspective, the relevance that the communities recognize to the 'placelessness' – the loss of the sense of places – is the convergent point between the landscape and the society. It becomes essential in leading the development-planning path in areas at risk and, above all, post-disaster initiatives of reconstruction [14]. By focusing on reconstruction issues, the 'sense of belonging' to places – the intimate feeling of being part of a system made of both tangible elements like squares, buildings, green lands, and of intangible matters like traditional celebrations, local music and food, etc. – also plays an essential role in considering urban landscapes as one of the most relevant dimension to be preserved in order to safeguard the community. Moreover, the act of *inhabiting* is not limited to the concept of home as dwells; rather it is defined by the set of places where the main activities of daily life take place. Indeed, public places are the result of dynamic processes conducted by city users who contribute to give meaning and function to urban spaces [15]. The role of public spaces in creating the bond between citizens and *home landscapes* is peculiar in thinking about the reconstruction beyond the emergency. Indeed, citizens are more likely to experience a severe trauma when they undergo a forced displacement and when the new settlements are planned as a series of houses/shelters with no attention for social gathering places and public activities. In post-disaster crises, the social fabric is one of the most damaged dimensions that needs to be *reconstructed* also through an attentive design of

the spatial context. Nowadays, besides the progress of social theories, researchers and decision makers can learn many pragmatic lessons from past disasters. Among the Italian cases, the earthquake of L'Aquila, in 2009, underlined the relevance of public spaces and social cohesion in the post-emergency phases. Here, associations and groups of citizens claimed the need to affirm their role and relevance in the spaces of the city through political actions like public protests and illegal occupations in reaction to top-down decisions to build new neighbourhoods (also known as *new towns*) lacking of collective facilities and public spaces (i.e. the C.A.S.E. project). On the contrary, in the regions of Friuli Venezia Giulia (1976), Marche and Umbria (1997), the public decision stood for the complete reconstruction of the urban settlements that was achieved through a complex bargaining process allowing for the restoring of the public space systems, and the reinterpretation of the morphological and topological legacy of pre-existing urban structures. These experiences shed light on a relevant matter: the built environment exists in human and collective memory beyond the value of construction materials [16]. It has a role in producing the social capital since the physical and ideological structure of spaces influences and reflects social connections and communications [17].

By considering the deep interplay between society, landscape and risk, urban planning becomes a fruitful operational field to outline measures of coexistence and resilient relationships in terms of risk mitigation and post-disaster recovery, also in non-emergency times. A risk-aware urban planning approach aims at improving the preparedness of citizens and decision makers in facing the inevitable transformations in landscape and society once the disaster happens. It means both to enhance the resilience of urban systems and to unburden the emergency phase in developing hurried solutions that are often unsuitable in the long run. The post-disaster reconstruction, indeed, is short-sighted if restricted to a legislative matter that establishes only economic and operational aspects since it will deeply affect future inhabitants' lives. Rather, the reconstruction planning finds roots in the main strategic frameworks of the ordinary planning instruments that, in risk-exposed areas, can anticipate and orient possible post-emergency scenarios by learning from the past events and by highlighting the sources – and thus the resources – of the bond between citizens and landscape. In this subtle relationship between urban plans and emergency plans – too often led by technical specialists in the field of economy and public administration – lays the successful improvement of the *build back better* approach that aims at achieving enhanced physical, social, economic and environmental conditions using the reconstruction process as an opportunity. Hence, the choice to give strategic relevance to places of the local identity becomes part of 'preliminary non-structural reconstruction measures' to be consistently developed with the non-structural and



Ameno has compromised the ability to respond to disaster and to *build back better*.

In the case of Ischia, this specificity can be traced back to the extension of the illegal settlements phenomenon: people who live in unauthorized buildings, in fact, do not have the right to draw on the funds for the reconstruction – provided by the national government. Therefore, it is difficult to start the reconstruction, freezing a state of things made up of risk and conflicts, even political ones. The drafting plan tries to overcome this state of stagnation, by subordinating the transformation to a city project discussed collectively on the basis of desirable scenarios and introducing the hypothesis of voluntary relocation of buildings from the seismic crater area. All redaction phases of the preliminary plan, up to the communication techniques of the contents and the design of preliminary scenarios were, in fact, oriented towards the construction of the imminent participatory phase<sup>4</sup>.

The scenarios aim at providing *visions* and drawing fundamental concepts that will be further specified in the final planning phase, they have a different transformative gradient and will be submitted to the public debate in order to achieve a common choice, able to be a driver for effectively keeping together resources and projects for a resilient reconstruction:

- Scenario zero is essentially based on the restoration of the places, proposes an intervention of building requalification and seismic adaptation that does not affect the settlement structure.
- Scenario one states the continuing existence of settlements through urban restructuring, providing infrastructural adaptation and new public spaces in the area with no variation of the number of inhabitants or morphological alteration of residential systems.
- Scenario two proposes a partial settlement decompression: by using a chronological criterion, the plan proposes the displacement of the damaged buildings, that are not part of the historical fabric (dated 1965), outside the area with maximum seismic exposure. The aim is to decrease the settlement pressure in an area characterized by high seismic risk and use new open areas as an opportunity to rethink public spaces and to create new places for the community and agricultural production.
- Scenario three proposes to relocate the whole settlement at risk outside the area of maximum seismic exposure for converting it into a green park with amenities. The area is reforested in ecological continuity with slopes of Mount Epomeo, while the new territorial park hosts services and activities according to environmental conditions and expected uses that will be discussed deeper with stakeholders and community. Thermal baths, green areas, squares with commercial and recreational activities coexist on the trails of the old village while some symbolic buildings (e.g. the

Church of Purgatory in Maio) could be rebuilt with anti-seismic structures, aiming at the twofold objective of preserving the historical memory and allowing the inhabitants of the island to maintain an effective, collective and innovative use of the places.

### Planning phases in the framework of the reconstruction governance

Besides the methodological approach and the research outcomes developed, it is necessary to underline that the planning process, and thus the research, have been affected by the system of laws and regulations that were provided by the national government to face the earthquake of Ischia.

The governance system has produced – so far – a set of top-down rules and regulation focused on the refurbishment of buildings, meaning a fruitless reconstruction concentrated on reactivating previous urban contexts.

The ongoing reconstruction process can be summarized into four phases. In the emergency phase, the committee appointed by the regional emergency department decided with the local mayors, to not displace citizens living in the *red area* in temporary shelters, but to financially support them for moving to hotels or other private accommodations. This choice, on the one hand, preserved the already compromised territory from further urbanization process, on the other hand, scattered the community moving people far from their *home places*, and distant from each other, thus dismantling the social fabric. As a consequence of this very precarious condition, the municipalities with the regional organization of the civil protection, throughout the eighteen months of the emergency phase, restored the main road network and some buildings. In a second phase, the reconstruction guidelines stuck at the government level (Fig. 4) since the national law 130/2018 (including reconstruction measures for the Ischia

earthquake) did not lead to regional and local actions either regulations, but just to a centralisation of powers to the special commissioner. In fact, the main institutional acts were the commissarial detailed ordinances (ordinance n. 5 and 7 respectively to cope with low and high damaged building reconstruction procedures) that established a punctual reconstruction – refurbish interventions on specific buildings – completely given to citizens<sup>5</sup>. In the third phase, in this barren situation, between the emergency phase and the await of the operability of the reconstruction law, the municipalities of Casamicciola Terme and Lacco Ameno recognised the need to develop urban plans to define reconstruction scenarios. In the last phase the implementation of the law 156/2019 asserted that the reconstruction of the hit municipalities must be framed in Reconstruction Plans<sup>6</sup> (PDR) in charge of a special committee appointed by the Campania Region. This committee composed by different professionals (mayors, municipal technicians, researchers, etc.) will define the criteria to outline the area where the plan has to be applied without any reference to the areas outside that perimeter – densely populated and exposed at risk as well. In conclusion, the latest proposed reconstruction model makes use of only one assessment indicator: the number of households given back to citizens through financial support. Thus, this mere bureaucratic approach – not inclusive of the community's needs – affords the chance to just *build back part* of the city, losing the opportunity to plan *better* by tackling the town planning problems and taking the chance to reduce risk and restore the balance between the natural landscape, the urban settlements and the citizens.

### Conclusion

Despite the several post-earthquake experiences, the national governance (Fig. 4) system still lacks a broad code of actions that can define

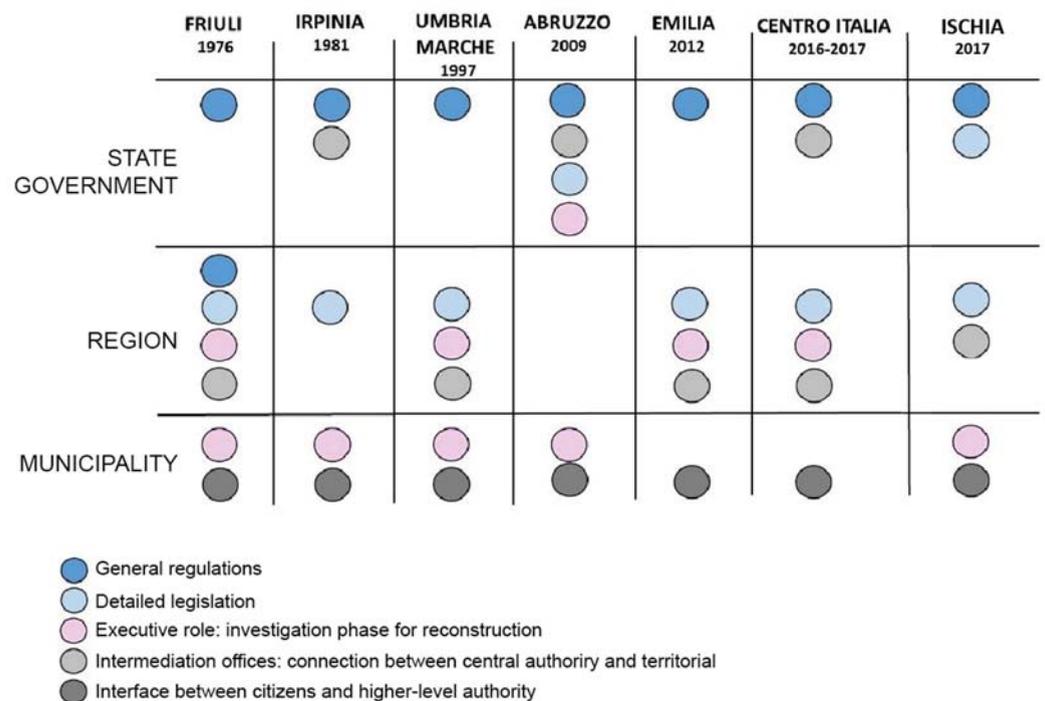


Fig. 4. Post-earthquake governance structures in Italy. Implemented by the authors, based on [22].

institutional roles at the different planning levels by setting time phases' goals and inclusive local processes. A shift from sectoral to whole-of-government [20] approach is needed. This calls for horizontal governance based on a common understanding of problems, resource exchanges, common language and values, official agreements [21] able to root out the conflicts of different interests and values that insist on landscapes. Moreover, the lack of a collaborative ground to interlace citizens' needs with territorial elements and risk components led to a still vague institutional framework for important disaster issues such as the reconstruction phase. Indeed, past events failed at organizing collaborative and inter-scale governance, as a result, the decision-making dimension has been transferred to third parties such as technical committees and government commissioners. Ultimately, the current governance structure misses building a resilient approach by blending the emergency phase with the recovery, avoiding the planning challenge to maintain and enhance the local economy and social connectedness of citizens through *building back better*.

The reconstruction of hit urban areas in Ischia, because of small-scale damage (Fig. 5), allows researchers, urban planners and decision makers to focus on some relevant matters such as the need to design alternative scenarios establishing a desirable development pathway that facilitates a participatory process. It means providing visioning and strategy making to post-disaster phases contributing to restore a balanced coexistence in uneven urbanization of areas at risk. Moreover, the Ischia case study sheds lights on the role of urban plans in designing risk areas not only by applying structural mitigation measures but challenging transformations through foreshadowing efforts. Indeed, if on the one hand urban planning can decrease the vulnerability of places by fostering *green* visions with a lower building impact, on the other hand, urban plans should point out the network of *structural invariants* of the landscape: the common grounds recognized by citizens as key elements (views, monuments, public areas, buildings, etc.) representative of the local identity. These elements are the first step towards resilient transformative strategies, fundamental in reconstruction phases. Finally, by considering disaster as a disruptive action that may force the territory to change, urban plans also contribute to building a *risk culture*, enhancing the risk awareness of citizens and including them in more sustainable urban transition processes. Although the reconstruction scenarios have not yet been tested in a participatory process, the applied methodology defines a framework to rethink the reconstruction within an urban development process and through the public engagement. The research study, by tackling the case of Casamicciola Terme and Lacco Ameno, underlines that urban plan represents the opportunity for local institutions and communities to participate in the top-down reconstruction process aiming at avoiding emergency solutions and defining well-designed strategies, finally turning post-disaster planning into an opportunity.

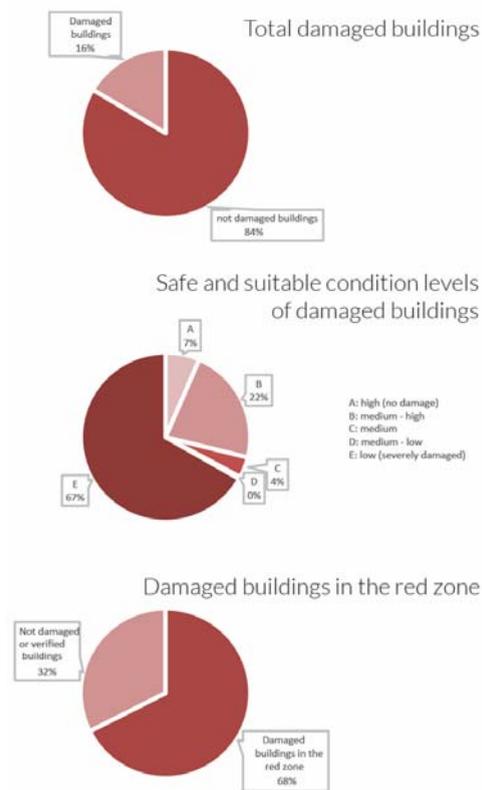


Fig. 5. Damage to buildings in C.T. (graphic by authors based on official data by the Emergency Committee, 2019).

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#### NOTES

1. The framework agreement was signed in April 2018 by the Department of Architecture (DiARC) of the University of Naples Federico II (UNINA) and the municipalities of Casamicciola Terme and Lacco Ameno. The research unit was led by prof. Michelangelo Russo (principal investigator) and prof. Enrico Formato (scientific coordinator).
2. Regarding the impact of the earthquake on the municipality of Casamicciola Terme see fig.5
3. The first part of the research was concluded in March 2020 with the approval of the preliminary urban plan by the municipality of Casamicciola Terme. On the contrary, the municipality of Lacco Ameno acknowledged the 'atlas' but it was not included in the preliminary urban plan.
4. The development of the urban plan of Casamicciola Terme - the only municipality that included the alternative scenarios as part of the preliminary urban plan - has not yet proceeded with the participatory phase. Thus, the research focused on the development of the atlas, the strategic guidelines and the

alternative scenarios as outcomes of the framework agreement.

5. The law states that in the event of a pending building amnesty a property cannot obtain the contribution for reconstruction. Nonetheless, even after obtaining the building amnesty, the refurbishment work can only be funded on the parts of the building that has not been under amnesty procedure.
6. The Reconstruction plan has the value of "Piano Urbanistico Attuativo - PUA" or implementation plan which is empowered to innovate ordinary town plan. The participatory process, according to the R.L. 16/2004 is about to present observation once the plan is adopted and published by the municipality.