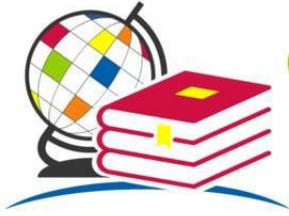


Natural Hazards and Disaster Risk Reduction Policies

Loredana Antronico - Fausto Marincioni
Editors





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“Natural Hazards and Disaster Risk Reduction Policies”,
Loredana Antronico, Fausto Marincioni (Eds.)
is a volume of the Open Access and peer-reviewed series
“Geographies of the Anthropocene”
(Il Sileno Edizioni), ISSN 2611-3171.

www.ilsileno.it/geographiesoftheanthropocene

Cover: A woman shovels mud from her driveway in the aftermath of the October 2010 debris flow that affected the Province of Vibo Valentia (Calabria, southern Italy).

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ISBN 978-88-943275-2-6

Vol. 1, No. 2, December 2018

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9. Increasing social and physical resilience to disaster through post-disaster planning: the case of Cascia Municipality

Federica Appiotti¹, Mattia Bertin¹, Francesco Musco¹

Abstract

The recovery after a disaster is a critical phase but it must be considered an unmissable opportunity to foster the social and physical resilience of impacted territories. As a matter of fact, recovery is considered as a/the phase during which the development of a disaster risk reduction awareness could be easily achieved through the identification of strategic sub-goals such as the inclusion of the concepts of adaptation and resilience to hazards. In this sense, post-disaster planning will become a tool of an inter-scalar disaster governance strongly connected with the ordinary governance of territories. Secondly, recovery is an essential moment in which awareness of land management, prevention and preparedness to hazards can be introduced to pursue territorial and social sustainable development. Thirdly, recovery requires a strong institutional coordination across sectors and level of administration that should result in supporting public/public and public/private innovative and useful collaborations. The present paper analyzes the case study of Cascia's recovery and post-disaster planning. The Municipality of Cascia, central Italy, was hit by the 2016-2017 earthquake sequence that caused many damages and economic losses in an already isolated territory. In 2017, Cascia has signed an agreement with the Iuav University of Venice for the development of a plan for the area's long-term recovery. The project, currently ongoing, aims to be a first significant example of public/public free collaboration in Italy. The main goal of the project is to offer a comprehensive and integrated vision of the Cascia's post disaster planning process, which can be replicated in other situations. In order to strengthen the current and future resilience of the area, Community-based approach, population preparedness and development of adaptive capacity, which will be discussed in detail in this paper are imperative within the whole process identified.

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Keywords: post-disaster planning, recovery, community-based approach, resilience

1. Introduction

Moe *et al.* (2007, pp 787) define a disaster as “a situation which overwhelms local capacity to manage it, necessitating a request to the national and international level for external assistance”. Disaster is derived from Greek meaning, ‘bad star’ (Konoorayar, 2006) and are classified in various ways. Independently from the disaster typology, a disaster management cycle has been developed by researchers and operators to illustrate disasters’ main phases. The disaster management cycle illustrates the ongoing process by which governments, businesses and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster and take steps to recover after a disaster occurred (Alexander, 2002). The disaster management is used to define standard and organized efforts for reducing harm to life, property and environment due to disaster in different and consequential time steps (Coppola, 2011). In this cyclic framework, for example, hazard mitigation that occurs after a disaster is still hazard mitigation in preparation for another disaster further in the future, as well as the recovery phase is already a phase in which awareness of land management, prevention and preparedness can be introduced and addressed. The Sendai Framework of Disaster Risk Reduction 2015-2030 (Unisdr.org, 2015) underlined that disasters are critical opportunities to “Build Back Better” including through integrating disaster risk reduction into development measures, making nations and communities resilient to disasters. It strongly suggests that the recovery phase give the opportunity to develop capacities that will reduce disaster risk in the short, medium and long term and will improve physical and social resilience (Archer and Boonyabancha, 2010).

Considering these elements, the role of urban planners is central in many disaster management phases, and, especially, in providing a wire that connects all the different phases, offering tools and competences to reach multiple goals and to introduce additional targets/topics and approaches.

Furthermore, planners can apply the concept of multi-objective management, in which hazard mitigation, adaptation management and sustainable development are made to coincide with the policy objectives of other stakeholders in the community (Schwab *et al.*, 2003). Furthermore, recovery is the phase in which the plans for post-disaster rehabilitation, developed in “peacetime” can be implemented, often using extraordinary

channels. An essential purpose of a post-disaster recovery plan is to provide vision that serves as a beacon for decision makers and some frameworks within which decisions will be taken (Cfr. Ivi). Decisions taken in the heat of the emergency period following a disaster influence the opportunities to re-build a safer, adaptable and resilient community in the future (Hopkins, 2001).

The paper illustrates the case study of Cascia Municipality, central Italy, hit by an earthquake of magnitude 6.5 in October 2016 and then in January 2017, which is currently in the middle of a post-disaster planning and recovery phase.

Cascia is a town of 3.000 inhabitants situated in the center of Italy, 80 km on South-East from Perugia and 200 km on North-East from Roma (see Fig 1). Cascia has a medieval architectural plant, developed on a system of 40 little villages on some hills. The city has been interested by an important economical evolution around Santa Rita devotional tourism between 1920 and 2000, that still before the earthquake used to attract in town 1'000'000 of tourists per year (Istat.it, 2016). This development has also broken the traditional plant with some suburban neighborhoods of bad quality 5-6 floor buildings, the most affected by the seism, and with an “archistar” intervention that disrupted the relation between center and valley. Also the earthquake has accelerated the crisis of this tourism model, suggesting the need of an offer differentiation. Moreover, Cascia is trying to face these landscape and economic themes, that, coming from long before the earthquake, are already urgent to be faced. Because of the Italian law on public servant number dimensioning, the Municipality is unable to face this huge intervention by itself, and need a big support in terms of knowhow and site-specific research. Therefore, Cascia Municipality is an example of an innovative process of public and public collaboration.

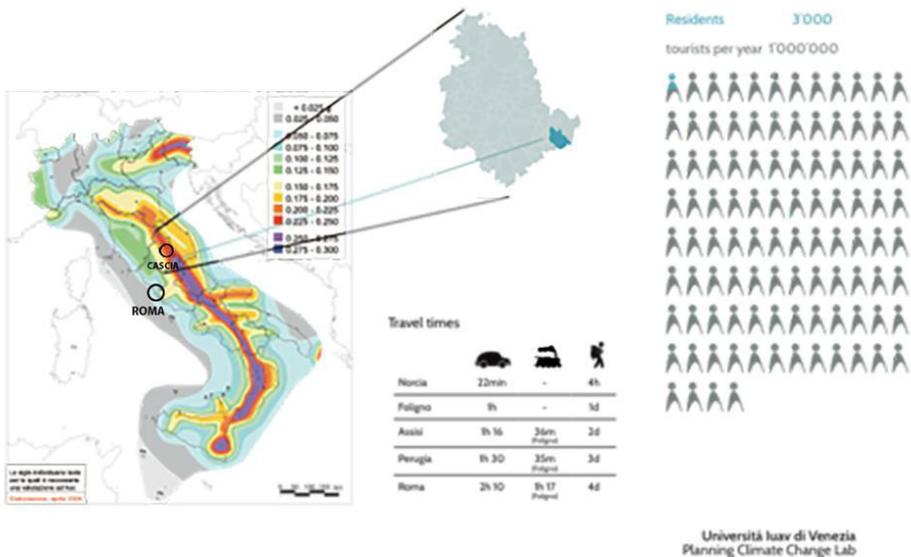


Figure 1 - Cascia Municipality localization, travel times and tourists-residents' ratio. (Data: INGV, 2008, Google, 2017, Istat, 2017).

2. An occasion for resiliency in post-disaster recovery

The disaster management process follows specific steps usually described according to the component of a cycle: (i) mitigation and prevention; (ii) preparation; (iii) response; and (iv) recovery (Alexander, 2002)

In the present paper, the authors, in accordance with Blaikie *et al.* (1994), Coppola (2011) and March *et al.* (2017) decided to refer to “recovery” phase of the disaster cycle as the process of rebuilding, repairing or reconstructing and returning a system to a functional state. The recovery phase complete the disaster cycle and aims at restoring affected communities to less vulnerable state (Alexander, 1999). It is not a static point or a single moment in time but is an extended process that includes the damages reparation and the restoration of community essential services creating. At the same time, this phase offers new opportunities for future development aligned with the principles of “sustainable development” and “Build Back Better” (Aldrich, 2012; Lindell, 2013; Unisdr.org, 2015) to

avoid or reduce future disaster risk. At social level, and in terms of social capital, the recovery phase involves different actors that must be re-bounded in order to re-create the social connections needed to support identified actions and measures (Aldrich, 2012). The Recovery Phase (RP) can be subdivided in two different stages: rehabilitation and reconstruction. As reported in UNISDR terminology (Unisdr, 2016), rehabilitation is defined as the phase of restoration of basic services and facilities for the functioning of a community or a society affected by a disaster. Reconstruction, instead, is defined as the medium and long term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for the full functioning of a community or a society affected by a disaster (Unisdr, 2016). Being part of the same main phase of the process, also the reconstruction must follow the Sendai Framework principles of sustainable development and Build Back Better.

The RP, and especially reconstruction, would be more effective and less onerous if it is well planned. However, planning needs to be holistic. As a matter of fact, as express in the above definitions, it is not merely a question of replacing damaging buildings stock and infrastructure, but also one of rehabilitating communities, ensuring equity and access to resources and reducing community vulnerability to existing hazard (Alexander, 2004; Berke and Campanella, 2006). The concept of applying a holistically view in the disaster management phases is strongly supported also by UNISDR Sendai Framework, especially in the recovery phase:

“Recovery needs to be viewed holistically - as part of a continuum, inseparable from preparedness, response, mitigation and sustainable development. Moreover, recovery must be approached in a cyclical nature wherein actions to strengthen resilience are taken both before and after disaster occur - rather than a linear approach that limits recovery action to the aftermath of an event” (Unisdr.org, 2017).

Indeed, as also expressed by March *et al.* (2017), disasters offer the opportunity to reconsider and improve upon a settlement’s characteristics. Furthermore, as a policy objective, mitigation and resilience should be pursued both during the pre-disaster period and programmed during the recovery phase and reconstruction periods (Schwab *et al.*, 2003; Berke and Campanella, 2006). To increase the resilience of an urban area in a disaster context means to enhance its ability to reduce losses, in terms of life and properties, as well to create a greater sense of place among residents, a stronger and more diverse economy and more economically integrated and diverse population (Vale and Campanella, 2005; Berke and Campanella, 2006). Alexander (2004) reported some historical examples in which sustainable disaster mitigation solutions have been incorporated into

recovery and especial reconstruction programs, while Berke *et al.* (2014), by reviewing 87 disaster plans in the US found that the plans weakly consider the achievement of long-term resilience as a leading element of the recovery plan. However, to achieve these objectives of risk reduction and sustainable development in an effective way, communities should plan reconstruction before disaster strikes to tackle it when it occurs: this is called “pre-disaster recovery planning” (Alexander, 2004; Berke and Campanella, 2006). Using these planning instruments, the introduction and implementation of measures and actions for increasing the resilience to disasters become the connection element between the pre and post planning process and the disaster management and recovery phases (Lindell, 2013). In this way, post-disaster planning can become, also, a tool of an inter-scalar disaster governance that is strongly connected with the ordinary governance of territories. Taking advantage from local effect could be an important occasion of redefinition of safe and dangerous mapping of an injured area. Doing this obviously means to focus on a post-disaster recovery not just as reconstruction, but, overall, as occasion of rethink a territory. (Cfr. De Marchi and Colten, 2009; Medd and Marvin, 2005, pp. 43-46).

As reported by Tierney (2012) “*disaster governance consists of the interrelated sets of norms, organizational and institutional actors, and practices (spanning pre-disaster, trans-disaster and post-disaster periods) that are designed to reduce the impacts and losses associated with disasters...*”. Good governance emphasizes local participation and power for the achievement of the strategic goals identified before and after a disaster. A bottom-up approach in the identification of the recovery strategic lines and in the application of local actions and measures is essential for achieving long-term goals and social support (Cfr. Blakely, 2007, 2012; Frisch, 2009).

In addition, the strong institutional coordination across sectors and level of administration needed to pursue recovery multi-objectives could result in supporting public/public and public/private innovative and useful collaborations.

2.1. Chronicle of a multidimensional earthquake

Between August 2016 and January 2017, four earthquakes of magnitude between 5.4 and 6.5 hit central Italy, determining a decidedly new phenomenon of emergence even for a country so familiar with seismic events. The phenomenon is peculiar for the considerable size of the crater area, including 131 municipalities distributed in 4 different regions: Lazio,

Umbria, Marche and Abruzzo (Gruppo di Lavoro INGV, 2016). Furthermore, it could be considered a unique emergent phenomenon that developed around four single events, different in intensity, position and period. One of the small town hit by the seismic sequence started in August 2016 is the city of Cascia.

Cascia, a small medieval city of the Val di Nera, developed around a system of villages and hamlets with a history and a representative structure of the image of the country, of its culture, of its beauty, and, at the same time, of today's difficulties for areas like this (see Fig. 2, 3). Despite the aspects related to Santa Rita pilgrimages and agri-food touristic potential, services and reception are the most important economic sectors of the city. On October 30th, 2016 an earthquake of 6.5 degrees Richter, the strongest in Italy since 1980, hit the area of central Italy, with effects perceptible to hundreds of kilometers away.



Figure 2 - *Effects of earthquake on historical city.*



Figure 3 - Effects of earthquake on XX century city.

After this main event, until February 2017 Cascia has been hit by violent earthquakes on several occasions, becoming part of the phenomenon called “Earthquake in Central Italy” and reporting serious damages by these phenomena. The 30 October 2016 earthquake rendered roads, houses, shops and the hospital unusable, in some cases for different months, in others until today, highlighting a need of a strong reconstruction intervention to overcome the large damages reported. Moreover, the urgency of an intervention for Cascia is connected to his role of center of gravity for different municipalities of the area, being the only one hospital center in 70 km and *fulcrum* of the economic and social activities of a large district. Cascia represents an example of the urban dynamic of central Italy small municipalities, that, despite being in a position of geographical isolation and,

in a sense of urban backwardness, aims at developing economically by preserving its peculiar characteristics. As reported in the ISTAT Database, Cascia is subjected by a progressive depopulation trend, in part coherent with the national demographic trends, and partially due to its geographical location that make accessibility and economic/social development difficult goals to reach. This phenomenon of abandonment of the area, together with its religious importance due to the presence of one of the most visited sanctuary in Italy, makes the area extremely interesting from a geographic-planning point of view.

The seismic sequence that is interesting Cascia's urban and surrounding area, and that is causing important damages on physical and social dimensions, is adding a new important goal for the area: increasing resiliency to future events by exploiting the window of opportunity offered by the happened "disaster". For this reason, in October 2017, one year after the main destructive earthquake, the Municipality of Cascia has recognized the importance of collaborating with an external institution to benefit from its expertise in terms of post-disaster reconstruction planning. As reported in the previous paragraph, the reconstruction phase is a complex process that involves many spheres of actions and that need trans-scalar knowledge and competences.

The present paper aims at offering an integrated vision of the Cascia's post-disaster planning process by identifying the most important elements and steps of the whole process. Moreover, the paper will highlight the importance of redefining collaboration relations and governance definition, in order of turn around the historical bureaucratic and economical limits of this territory (Luhmann N., 2005; Paba, 2010, pp. 108-109). The post-disaster planning process that is under definition, will be based on the awareness that a community-based approach is imperative to strength the current and future resilience of the area and to offer new lines of economic development. Additionally, a discussion about the importance of the sharing of knowledge and competences in post-disaster planning as main elements to increase social resilience of territories will be presented. The Cascia's post-disaster and future development planning process will be structured looking at three main dimensions: social, physical and of governance.

3. University role in post-disaster recovery as bottom-up action support

First of all, reconstructing Cascia means providing the community with innovative ideas and perspectives oriented to rethink its shape and its

attractiveness in the near future, bringing together economic, social and physical interventions. Secondly, the Cascia's citizens and administration propensity to act and actively manage the emergency and post-emergency phases should be strongly considered as a replicable approach also during the following recovery steps. In fact, the safety of Cascia, and the possibility of saving it from abandonment, has been possible thanks to the tenacity and self-organization of the population, which played a role as first rescuer of itself, providing work and resources for return to their autonomy. Taking care of Cascia reconstruction means over all giving scientific and communicative support to an active self-promoting citizenship that has engaged itself in emergency management. Supporting Cascia regeneration means providing this community with innovative ideas and perspectives, through which rethink its form and its attractiveness in the near future.

The collaboration between Iuav University and Cascia Municipality started from a voluntary initiative of some Iuav researchers in emergency management in supporting the city's recovery phase. Cascia's local administration and Iuav research staff decided to catch the important opportunity of applying an innovative approach in recovery phase after a real disaster.

The work has been organized starting from three main field trips, thought as occasions to recognize and define the peculiarities of Cascia's catastrophe, the tools needed to be activated in short time and to describe the local and regional governance to be involved. This preliminary phase ended in July 2018 and a second phase started in September 2018 and will end in December 2019. At time of writing, the work is at the beginning of the second phase.

In this second phase a scholar experience workshop of three weeks is going to be organized aiming at: (i) analysing dynamics, strengths, weakness and opportunities of the area; (ii) constructing a vision and some specific objectives for the area including resilience and sustainability features; (iii) proposing some design hypothesis and interventions as based of discussion with local citizens; (iv) undertaking a first moment of discussion with local population.

Indeed, in accordance with "Urban Vulnerability and Good Governance" (Lewis and Mioch, 2005), the works plan will be organized considering an active involvement of private and public sectors in all the recovery sub-phases. The involvement of public and private local sectors, as well as representative of local demography is supported by the Lewis and Mioch (Ivi, p. 51) statement: "The equation of rights and responsibilities is particularly important in disaster risk reduction; people have a right to feel

protected in their communities, yet equally they need to be aware of their shared responsibility to protect themselves”.

Therefore, two permanent participation groups will be created for the entire duration of the 2-years process. The first one, aims at being representative of the local productive sectors, will be composed of farmers, restaurateurs and hoteliers and the artisans of the valley. The second will bring together the presidents of the Cascia’s fractions, representing the most complete and complex form of this territory. A permanent space will be identified and selected to be a physical place of discussion about the evolution of the recovery process. In this step, Iuav responsibility will be to organize these groups, to focus them on a clear step based program, avoiding to feel university role as super decisor, but to act as a partner in the game. To do this, the Stanley (2017) consideration’s will be kept in mind: “A further challenge for planning is how to effectively combine vertical governance or decision making from the bottom up with decision making from the top down, in order to integrate local citizens participation with broader, strategic planning goals”.

The local intervention will start in October 2018, with the supervision of a research team directed by Prof. Edward Blakely, in a ten-days residence experience in Cascia. This experience will let start the groups activity, and aim at producing the program and the goal expected by the group work. After that the direction of the groups will be let in hand of the local administration, in connection with Iuav team to discuss the evolution of the project and the respect of the goals.

The ambition of this methodology is to improve a real shared new culture of Cascia recovery phase, trying to delete the main reconstruction errors of the past times and, especially, to take advantage of the real opportunity that the “disaster” is offering to this territory of reconstructing its identity in a resilient and sustainable way.

Cascia recovery, and regeneration, will be organized around three superimposed levels and objectives: Re-Bulding Re-Storing Re-Breeding. First of all, to develop the XXI century urban and surrounding area of Cascia rethinking the outskirts of the city center, and transforming an expansion of low aesthetic and residential quality, strongly damaged by the earthquake, into the access avenue of the Municipality is mandatory. Secondly, the project will try to redesign the relationship and mobility between the villages and the village at the bottom of the valley. Thirdly, the promotion of a diffused hotel receptive model and the establishment of some high quality agri-food production disciplinary, organized around a high-level coordinated communication will be pursued. Finally, planning for

safety and resilience, with attention to seismicity and climate change will be addressed.

The application of this approach, fully embraced by the local administration, is discounting the predictable perplexity of the administratively superior level (Region). The bureaucratic top-down structure is right now normally asking for the respect of a vertical command and control line in regeneration planning and developing, defending a supposed know how inside this structure. (Cfr. Crozier, 1978, pp. 61; Lindell, Meier, 1994, p. 222) One of the most relevant problem in the realization of the project will probably be the active involvement of local bodies on one side, and, on the other, to convince regional administration that is mandatory to “dispel the myth of hierarchical control”, (Comfort, 2007, p. 190) keeping them to consider recovery as “a participative process of hermeneutical recognize and of community building” (Bertin, 2018, p. 134). This will an occasion of win-win collaboration between different agency in public administration and citizens. Moreover, the project would be coherent with the four priorities for disaster risk reduction actions stated in the Sendai Framework:

- (i) Understanding disaster risk – by implement a studying phase on the area to better understand the present hazards and potential impacts;
- (ii) Strengthening disaster risk governance to manage disaster risk – by actively involving local administration, stakeholders and the community in the whole planning process;
- (iii) Investing in disaster risk reduction for resilience – by informing and involving productive and financial sector in the post-disaster planning process to increase physical, social and economic resilience;
- (iv) Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction – by considering that prevention and protection must be pillars also of the reconstruction phase as well as physical and social resilience.

The project’s structure, the actors involved and the principles guiding the post-disaster recovery and planning phase in Cascia will consider these priorities for action in each project’s phase.

4. Conclusions

The paper describes the implementation of a post-disaster recovery process in the Municipality of Cascia based on the active collaboration among different types of public entities. The process, currently on-going, is

demonstrating a significant potential in taking efficiently advantage of the window of opportunity offered by the October 2016 and January 2017 seismic events. A structured and programmed participation of the Iuav University institution is offering an essential support in the recovery process, especially in marginalized and hardly accessible areas such as the one of Cascia. The knowledge and competence on post-disaster and adaptive planning, participation, economic evaluation and monitoring, offered voluntarily by the University institution, as well its scientific and institutional network, is becoming completely accessible to the small municipality under discussion. At the same time, the described area is offering the opportunity to the research to carry out parallel studies on post-disaster recovery plans and on a real social/physical reconstruction process, especially focusing the attention on the emerging bottlenecks from the integration between community-based and institutional-based processes.

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Natural Hazards and Disaster Risk Reduction Policies collects 14 original essays, of authors from all around the World, exploring strategies and ability of local communities to adjust to natural hazard and disasters. The volume, fostering the current scientific debate on disaster ecology, muses about the need for Homo sapiens to define its rights and responsibilities in environmental dynamics, including extreme events and disasters. In the end, the reflections about how to deal with hazard, vulnerability and disasters, highlights the ethical nature of disaster risk reduction; control of nature or adaptation to its cycles?

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Edizioni



ISBN 978-88-943275-2-6