

1.3 UNDERSTANDING POST-DISASTER RECOVERY PROCESSES: IS THERE SPACE FOR LEARNING AND EXPERIMENTATION?

Irene Bianchi

Politecnico di Milano

The role of learning and experimentation in recovery processes

The need to effectively deal with extreme natural events (concerning both the *prevention of* and *reaction to* disasters) has been widely recognised as a substantial challenge faced by policy-makers and practitioners working in different fields and at different territorial scales. On the one hand, this growing attention is due to the increasing occurrence of extreme events and the high impact they have on physical, environmental, and social resources. On the other hand, it is related to the fact that global exposure to natural hazards has doubled over the last forty years (PESARESI et al. 2017, p. 66). Climate change is expected to further increase the frequency and magnitude of extreme natural and weather events in the next decades (IPCC 2014).

The urgent need to support disaster risk reduction and to enhance local preparedness, as recognised by the Sendai Framework as priorities in the international agenda (UNISDR 2015), contributed to the emergence of disaster-resilience-related issues both in urban policy debates and in academic discourses. In this context, long-term post-disaster recovery processes have also increasingly gained relevance. These processes have been relatively understudied in the last decades (QUARANTELLI 1999, TOPPING and SCHWAB 2014) both in disaster management literature, which has mainly focused on emergency management and risk mitigation, and in the international urban studies literature, which has often treated long-term recovery as a marginal field of study in the broad debate about spatial and social transformation processes.

What does ‘recovery’ mean? How do cities and communities react to a shock, and how do they respond and reorganise in an environment characterised by high political

pressure, poor information, and high levels of uncertainty? Over the last decade, scholars have questioned the theoretical and normative foundations of recovery models and have tried to understand how recovery processes work in practice (see OLSHANSKY 2017 for a review). Despite this renewed interest, however, limited attention has been paid so far to the identification and analysis of those resilience-building mechanisms that enable the enhancement of local preparedness and risk reduction and ultimately enable social and policy change.

This short paper - developed as a contribution to the conceptual framework of an ongoing research thesis about resilience-building and reorganisation practices in risk-prone areas – will discuss the role of learning and experimentation in the development of long-term reorganisation processes that take place in the aftermath of extreme natural events. By looking at recent literature published in the fields of urban, resilience, and disaster studies, the paper will first briefly trace the evolution of post-disaster recovery discourses in light of emerging perspectives about urban and community resilience. Based on a review of interdisciplinary contributions, it will then elaborate on the role of learning and experimentation for resilience-building and define the potential value of adopting a social innovation perspective to the understanding of post-event urban and community dynamics. Finally, the paper will identify some relevant political and organisational barriers that (may) inhibit the capacity of affected territories and involved populations to learn and (pro)actively build resilience.

Disasters as drivers of change: the evolution of recovery discourses

Natural disasters as drivers of change

The way in which post-disaster recovery processes are conceptualised and framed primarily depends on the role of natural disasters within socio-spatial transformation processes.

Disasters are, by definition, disruptive, since they cause a sudden loss of physical, economic, and human resources and partially demolish - or at least damage - “what urban planners strive to accomplish: systems that support the lives of residents” (OLSHANSKY and CHANG 2009, p. 200). However, by looking at extreme natural events from a wider perspective it is possible to conceptualise them more generally as *drivers of change*. Concerning the physical structure of a city, they damage building stock and infrastructures - to an extent that depends on both disaster intensity and urban vulnerability patterns – and often cause physical displacement. They affect social dynamics in different ways, leading to the emergence of new social needs (SCHWAB 2014) and to new patterns of

marginalisation and exclusion, which often reproduce and strengthen existing socio-spatial divides (QUARANTELLI 1999, VALE 2014). Extreme events also cause a collective socio-psychological trauma (VALE and CAMPANELLA 2005), modify relational patterns, and impact the interdependent relationship between affected communities and their environment, thus “altering the way individuals relate to, remember and experience the world around them” (CRETNEY and BOND 2016, p. 5).

The changes triggered by extreme events are not necessarily negative in absolute terms. Disasters can, in fact, be considered ‘focusing events’ (BIRKLAND 1997, in CHOULARTON 2001, p. 67) that bring attention to themselves and to their causes. They bring out both pre- and post-disaster structural and social vulnerability patterns, highlight previously underestimated or ignored urban and territorial fragilities and risk-related dynamics, and lead to the emergence of new priorities. In line with a socio-ecological understanding of resilience (FOLKE 2006), these events, therefore, have the potential to open a ‘window of opportunity’ (GUNDERSON 2010) that could eventually lead to increased urban and community disaster resilience (ADGER et al. 2005) and to societal betterment (PERRY and QUARANTELLI 2005, p. 341). In organisational terms, natural disasters can be conceived as ‘threshold events’ (BIRKMANN et al. 2008, p. 638) that modify relational patterns among actors across multiple territorial scales and provide affected systems with the chance to transform and reorganise.

Disaster resilience and post-disaster recovery: shifting perspectives

This double-sided conceptualisation of disasters as disruptive and transformative events has led to a substantial shift in the understanding of post-disaster recovery as framed both in urban studies and in disaster management literature.

Concerning theoretical models of recovery, the historical evolution of the concept has seen the overcoming of a rational definition describing it as an “ordered, knowable and predictable process” (HAAS et al. 1977, pp. xxvi-xxviii) primarily aimed at physical reconstruction. Instead, more systemic and context-aware models have emerged which conceive post-disaster recovery as a complex, multidimensional, and non-linear process (see BERKE et al. 1993, JOHNSON and HAYASHI 2012, p. 227). Following the latter understanding, scholars have recognised that post-event reorganisation processes are not merely a matter of disaster management - however important this may be (VALE and CAMPANELLA 2005) – and that their success depends on the interplay between social, organisational, and physical dynamics. In particular, the effectiveness of recovery processes relies on the capacity of affected systems to enhance risk mitigation as well as governance adaptation and local capacity-building. This process-focussed reorientation of the debate, therefore, entails an attempt to enlarge the scopes of recovery. It is maintained that structural and infrastructural restoration cannot be the sole and ultimate goal of the process (see RUBIN et al. 1985, ALDRICH 2010, ARENDT and ALESCH 2015, to

name a few), but that it is necessary to promote risk reduction through mitigation and adaptation as well as community and institutional readiness for future events (see, e.g., SCHWAB 2014, O'BRIEN et al. 2010).

Recent scholarship has also focused on the socio-political dimension of post-event institutional and social reorganisation efforts, defining recovery as a “socially-configured process” (TIERNEY and OLIVER-SMITH 2012, p. 123) and emphasising “the differential nature of recovery as a process that creates both winners and losers” (TIERNEY 2013, p. 2). It has been highlighted that “factors such as power, race, class, gender, past disaster experience, and access to resources [...] can all play a role in shaping the process for social units ranging from households to societies” (SMITH and WENGER 2007, p. 237). In this perspective, many scholars underlined that “restoring critical infrastructure and preserving and rebuilding a city’s urban architectural fabric are critical to full recovery, but efforts must also be made to repair a community’s torn social fabric” (BERKE and CAMPANELLA 2006, p. 216). According to JOHNSON (2009, in JOHNSON and HAYASHI 2012), ‘restoration’ in terms of the rehabilitation of systemic functions and social and institutional reorganisation that may take place in the medium to long-term are two complementary and interdependent dimensions that need to be considered when analysing recovery processes and assessing their effectiveness.

Without entering into the details of the endless discussion about the definition of resilience as a concept and as a framework, it is possible to observe that the reorientation of the disaster recovery debate is grounded on a ‘forward-looking’, dynamic, and evolutionary understanding of resilience (FOLKE 2006). This is not defined as the ability of the system to return to its equilibrium point after a disruption, which could be translated as a ‘return to normalcy’, i.e. to the *ex ante* (pre-disaster) status quo, but rather by the degree to which (urban) “complex adaptive systems are capable of self-organization [...] and to build capacity to learning and adaptation” (ADGER et al. 2005, p. 1036). More critical views have made a claim for the need to redefine (disaster) resilience in political terms (DAVOUDI et al. 2012, VALE 2014, DEVERTEUIL and GOLUBCHIKOV 2016). Critical geographers and urban scholars, in particular, have questioned the concept of resilience as applied to social systems - including social-territorial systems - by arguing that it is politically ambiguous (DAVOUDI et al. 2012) or even ‘conservative’ (MACKINNON and DERICKSON 2012). They maintained that the lack of a clear normative reference framework has often contributed to the understanding of resilience as a value-free concept, which makes the resilience framework susceptible to political instrumentalization. They claimed that it was necessary to consider “issues of justice and fairness in terms of both the procedures for decision-making and the distribution of burdens and benefits” (DAVOUDI, in DAVOUDI et al. 2012, p. 306), ultimately stating that “resilience can only remain useful as a concept and as progressive practice if it is explicitly associated with the need to improve the life prospects of disadvantaged groups” (VALE 2014, p. 191).

Critical perspectives contributed to redefining urban resilience [to disasters] “as a proactive rather than reactive view to planning, policy-making and strategic steering in

which communities play a vital role for resilient place shaping through their capacity for active learning, robustness, ability to innovate and adaptability to change” (MEHMOOD 2016, p. 413, see also WILKINSON 2011, DAVOUDI et al. 2013). This understanding of urban resilience takes into account the local sustainability of recovery practices (following BERKE et al. 1993) and is grounded on a relational understanding of places, which are not conceived as “units of analysis or neutral containers, but as complex, interconnected socio-spatial systems with extensive and unpredictable feedback processes which operate at multiple scales and timeframes” (DAVOUDI, in DAVOUDI et al. 2012, p. 304). Place-based approaches acknowledge the need for context-aware recovery practices, recognise that they are shaped by “both pre- and post-disaster conditions” (SMITH and WENGER 2007, p. 267), and emphasise the role of local communities in the recovery process. In this respect, emerging recovery perspectives argue for overcoming more ‘paternalistic views’ that are characterized by few linkages to equity and contextual conditions and by an understanding of disaster-stricken people exclusively as “helpless, poor victims”, rather than as “pro-active participants in the recovery process” (BERKE and CAMPANELLA 2006, p. 203).

This argumentation has been developed further and has led to the emergence of social capital as a critical recovery concept (NAKAGAWA and SHAW 2004, ALDRICH 2010 and 2012, JOSHI and AOKI 2014, ALDRICH and MAYER 2015). The basic idea underpinning this view is that “moving more money, supplies and experts into affected areas [will not necessarily] result in a faster recovery” (ALDRICH 2010, p. 2), but that “the ties that link citizens together function as the main engine for post-disaster recovery” (ibidem p. 1). It is stated that structures of social capital (including bridging, bonding and linking social capital, see NAKAGAWA and SHAW 2004, p. 21) influence recovery patterns and are crucial in determining the effectiveness of recovery responses and the success of policy implementations (JOSHI and AOKI 2014, p. 100). The importance of both vertical and horizontal integration is highlighted (starting from BERKE et al. 1993), and the role of intra-community and inter-institutional ties is recognised as crucial for the definition and implementation of recovery strategies that are capable of supporting organisational and social adaptation.

Social capital is also considered a key element for fostering community resilience, which is defined as “the existence, development, and engagement of community resources by community members to thrive in an environment characterised by change, uncertainty, unpredictability, and surprise” (MAGIS 2010, p. 402). Along with recovery processes, the ability of local communities to respond and to proactively participate in post-event reorganisation processes is crucial not only because they are “the first to respond [to the emergency] and the last to leave” (VALLANCE and CARLTON 2015, p. 27), but also because they can provide social support and assistance (CUTTER et al. 2008, NORRIS et al. 2008), shape recovery management through active participation in decision-making (BERKES and ROSS 2013, VALLANCE and CARLTON 2015), activate social memory (BODIN et al. 2006), and support social learning (TIDBALL et al. 2010).

Learning and experimentation in and for disaster recovery

Social learning and resilience-building

Within the growing body of literature on urban disaster resilience, limited attention is paid to the mechanisms through which social actors, as embedded in existing governance structures, (eventually) develop their capacity to adapt to and cope with future events.

Resilience frameworks, including the ones addressing social-ecological resilience (see FOLKE 2006) and those explicitly referring to disaster resilience in social-territorial systems (e.g. CUTTER et al. 2008), generally agree on the importance of social learning as a crucial element for enhancing the adaptive and coping capacity of social and institutional systems. Notably, social learning does not refer solely to the acquisition of new knowledge and skills but is instead defined in pragmatic terms as a practice of knowing (see IBERT 2007). Learning is co-produced “through social interactions and processes between actors within a social network” (REED et al. 2010, p. 1) and occurs when a change in understanding takes place that “goes beyond the individual and becomes situated within wider social units or communities of practice” (ibidem p. 1). Accordingly, resilience-building has itself been conceptualised as “a process of learning at all levels” (O’BRIEN et al. 2010, p. 506).

Concerning individual actors involved in the recovery processes, social learning is crucial for triggering a proactive change in habits and behaviours and, ultimately, for supporting the development of adaptive and coping mechanisms. Through learning affected actors can enhance their *capacity for action* that ultimately has to do with “the ability to enact and to use organisational rules and procedures, and with the degree of control that the actor can exercise on the rules and procedures” (LANZARA 1983, p. 78). When engaged in shared learning processes, affected actors can become “more confident and competent at identifying, analysing, reflecting and adapting their own schema of understanding and practices for living in an uncertain world” (PELLING et al. 2015, p. 2). Therefore, iterative learning processes accompanying the response and recovery phases have emancipatory potential. On the one hand, they are required to improve what LANZARA (1993) calls their negative capability of “being in uncertainty”. On the other hand, learning processes can contribute to enhancing the socio-political capabilities of the affected actors, e.g. by creating new skills and knowledge (MURO and JEFFREY 2008, p. 330), enhancing horizontal integration, and supporting what MOULAERT and colleagues (2005, MOULAERT 2009) define as the “empowering dimension” of social innovation.

Within actor networks, shared learning processes developed through social interactions are required to collectively make sense of changing situations, to identify

new needs and priorities, to integrate existing knowledge (e.g. including expert and experiential knowledge as defined by KHAKEE et al. 2000), and to mobilize endogenous financial, social, relational, and cognitive resources. Thus, social learning in post-disaster contexts is crucial for supporting the co-creation of resilience-oriented practices at different scales.

When looking at the institutional level, social and organisational learning is also necessary to support governance adaptation and enable involved institutions to be flexible enough to “evolve over time in response to dynamic post-disaster conditions” (KUMAR 2015, in OLSHANSKY 2017, p. 4). From the perspective of social innovation (see MOULAERT et al. 2005, MOULAERT 2009), shared learning has the potential to support process innovation by redefining relational patterns within existing social capital structures, which contributes to the transformation of both social and power relations (see MOULAERT 2009).

Independently from the level at which it takes place, social learning in recovery settings is needed to reframe disasters as ‘learning opportunities’ and support forms of reflection *in* and *on* action (SCHÖN 1983). Social learning is important not only for developing alternative strategies and new ways to pursue pre-defined goals but also for questioning the values which policies are grounded on, i.e. social learning supports profound behavioural change along the adaptive cycles. Critical reflection (ARGYRIS and SCHÖN 1996) is particularly relevant in post-disaster environments (see MCCARTHY et al. 2011), in which “the emergence [of new groups and of ways of doing things] is forced by the fact that traditional agencies and procedures cannot always deal effectively with disaster generated needs and difficulties” (QUARANTELLI 1999, p. 8).

Social learning and critical reflection in post-disaster settings also require an open attitude towards experimentation and innovation. The emergence of (social-)innovation-oriented practices and behaviours also depends on the capacity for improvisation, which can be broadly defined as “the conception of action as it unfolds, drawing on available cognitive, affective, social and material resources” (KAMOCHÉ et al. 2003, p. 2024). Improvisation, e.g. regarding self-organisation and bottom-linked coordination, may lead to the development of informal communities of practice that function “as vehicles for peer learning, facilitating resilience building” (PELLING et al. 2015, p. 2). As the disaster of place model developed by CUTTER et al. (2008, pp. 601-603) acknowledges, social learning and improvisation are the two ways in which communities can exercise their adaptive resilience (in terms of flexibility when responding to changing conditions) and support the inherent resilience of place (defined by the capacity to function properly in non-crisis periods).

Barriers to resilience-building

Even if some degree of consensus about the need to support social and organisational learning during the recovery phases has been reached, recovery practices are often

incapable of fostering resilience-building through learning and experimentation. A look at the recent literature makes it possible to formulate some preliminary reflections about time, political, and organisational constraints regarding governance adaptation and community socio-political emancipation that affect recovery processes.

While some barriers are related to contextual variables and dynamics, others are defined by common elements that characterise recovery processes, i.e. “compressed time-conditions” (OLSHANSKY et al. 2012), poor information, political tensions, and the urgent demand for action (OLSHANSKY and CHANG 2009).

The first barrier is the cognitive complexity that characterises complex actor networks, which are composed of actors with different knowledge and experiences, who operate using multiple frames. Also, the ‘novelty’ character related to the uniqueness of post-disaster settings may negatively affect learning. Especially in the case of major disasters, “common knowledge used in the past may not have the capacity to represent the novelties now present resulting in a knowledge/experience gap and reduced resilience” (CARLILE and REBENTISCH, 2003, in PELLING et al. 2015, p. 39). A further problem is related to urgency. As highlighted by MOYNIHAN, the time compression that characterises post-event environments negatively affects *intra-crisis* learning, insofar as “during crisis, actors must engage in sense-making under limited time, dynamic conditions, and intense pressure, evaluating the scope and nature of crisis and searching for an appropriate response” (2009, p. 191). Consequently, limited time is associated with cognitive limitations and political pressures, which contribute to hindering the capacity of communities and institutions to develop coping mechanisms through learning.

In terms of political barriers, high political pressure negatively affects the capacity for horizontal integration and self-organisation (see VALE 2014, VALE and CAMPANELLA 2005), and it can shrink the space for dialogue and collaboration, where “socially innovative experiences can develop, interact and penetrate into urban governance relations” (GEROMETTA et al. 2005, p. 2008). Political constraints are also related to the complexity that recovery practices have to face, to the multiplicity of actors involved, and to the fragmentation of governance structures. Another major problem in this respect is the impossibility to solve what OLSHANSKY and colleagues (OLSHANSKY 2005, OLSHANSKY and CHANG 2009, OLSHANSKY et al. 2012) call the ‘speed versus deliberation dilemma’, i.e. the difficulty to achieve time-consuming forms of political deliberation in the high-speed environment of disaster recovery. Concerning organisational barriers, space for experimentation and innovation is often limited by constraints related to the rigidity of bureaucratic processes, which by design do not compress easily (OLSHANSKY et al.: 2012), and by the ambiguous allocation of competences across various scales and sectors. All of these barriers strongly influence recovery practices, which often follow procedural approaches.

Concerning decision-making processes, these approaches set priorities according to previously established high-level goals, defined by a top-down political process that often ignores emerging social needs as determined by the actors involved. They

mainly rely on vertical decision-making structures and do not leave any space for experimentation and self-organisation, thus de facto hindering both governance innovation and community empowerment.

In operational terms, cognitive constraints do not allow for a framing of recovery as situational and context-dependent processes, co-produced by the system's agents. Recovery strategies and measures are developed considering exclusively expert and technical knowledge, thus denying the complexity of post-disaster dynamics and neglecting procedural and epistemic uncertainty embedded in processes that take place within complex socio-territorial systems (BRUGNACH et al. 2008). Procedural approaches, therefore, tend to consider recovery as a process that is 'external' to the context, instead of supporting institutions and local communities in acquiring a better understanding of 'disasters in context'. These may result in a "lack of incorporation [of the recovery actions] into the socio-economic activities of local people" (NAKAGAWA and SHAW 2004, p. 6), which is crucial for fostering the coping capacity of local communities. The conceptualisation of recovery processes as 'external' to the context supports the use of external sources of knowledge while hindering knowledge integration, thus discouraging in-context social and organisational learning.

The urgency to secure the achievement of liveability conditions seems to support the prioritisation of measures and actions that seek to achieve physical restoration – related to the satisfaction of immediate needs - while ignoring the need to promote contextual resilience by including the social and organisational dimensions of recovery. An exclusive focus on the rehabilitation of physical infrastructures may also be associated with a long-term dependence on external aids and resources and may therefore raise some controversial political issues.

Conclusions

Recovery literature has evolved over the last decades. It has been increasingly defined as a process with the potential to open up opportunities for change and as a critical stage in which urban and community resilience can be built and socially innovative practices can be generated and developed. Recovery is therefore no longer associated with a 'return to normalcy'. Persistence is one of the features of resiliency processes, together with the capacity for learning (through preparedness), being flexible, and being innovative (see DAVOUDI 2012, MEHMOOD 2016).

On the one hand, the possibility to seize the transformative opportunity provided by extreme natural events depends on the capacity of the affected actors (starting from local communities) to learn together, to mobilise their resources, to act beyond formalised structures, and to coproduce post-event reorganisation practices. On the other hand,

it relies on the capacity of multi-level governance structures to be flexible in the face of crisis, to support organisational adaptation, and to foster capacity-building across various scales.

Some political, organisational, and time barriers inhibit learning and often make it impossible to integrate the results of learning processes both in policy measures and in community practices. These barriers depend on characteristics that are common in post-disaster situations (urgency, inadequate information, political pressure, etc., see OLSHANSKY 2017), but also on contextual dynamics that are embedded in place-based dynamics and are nested in social and governance networks. As a result, even if command-and-control approaches seem superseded, response and recovery schemes are often developed by adopting short-term perspectives, are incapable of mobilising endogenous social, environmental, and physical resources, of promoting local community preparedness, and - ultimately - of navigating urban systems towards resilience.

Concerning the understanding of recovery as a process, further research is needed to explore the link between learning, social innovation, and community resilience in post-disaster environments. Finally, in order to better understand how recovery does (or does not) work in practice, it is also necessary to further investigate barriers and enable learning and experimentation, and to consider the way in which they affect the capacity for action of the actors involved in post-event reorganisation practices.

References

- ADGER N.W., HUGHES T., FOLKE C., CARPENTER S., & ROCKSTROM J. (2005), Social-Ecological Resilience to Coastal Disasters. *Science* 309, pp. 1036-1039.
- ALDRICH D.P. (2010), Fixing Recovery: Social Capital in Post-Crisis Resilience. *Purdue University e-Pubs*. <http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1002&context=pspubs> [Last accessed on 02-04-2017]
- ALDRICH D.P. (2012), Building Resilience: Social Capital in Post-Disaster Recovery. Chicago, Chicago University Press.
- ALDRICH D.P., & MEYER M.A. (2015), Social Capital and Community Resilience. *American Behavioral Scientist* 59(2), pp. 254-269.
- ARENDT L.A., & ALESCH D.J. (2015), Community Disaster Recovery: Definition, Processes and Obstacles. In: ARENDT L.A., & ALESCH D.J. (eds.), *Long-Term Community Recovery from Natural Disasters*. Boca Raton, CRC Press, pp. 147-175.
- ARGYRIS C., & SCHÖN D.A. (1996), Organizational learning II: Theory, method, and practice. Reading, MA, Addison-Wesley.
- BERKE P., & CAMPANELLA T.J. (2006), Planning for post-disaster resiliency. *The Annals of the American Academy of Political and Social Science* 604(1), pp. 192-207.
- BERKE P., KARTEZ J., & WENG D. (1993), Recovery after disaster: Achieving sustainable development, mitigation and equity. *Disasters* 17(2), pp. 93-109.

- BERKES F., & ROSS H. (2013), Community Resilience: Toward an Integrated Approach. *Society and Natural Resources* 26(1), pp. 5-20.
- BIRKMANN J., BUCKLE P., JAEGER J., PELLING M., SETIADI N., GARCHAGEN N., FERNANDO N., & KROPP P. (2008), Extreme events and disasters: a window of opportunity for change? Analysis of organizational, institutional and political changes, formal and informal responses after mega-disasters. *Natural Hazards* 55(3), pp. 637-655.
- BODIN Ö., CRONA B., & ERNSTSON H. (2006), Social networks in natural resource management: what is there to learn in a structural perspective. *Ecology and Society* 11(2), pp. 1-8.
- BRUGNACH M., DEWULF A., PAHL-WOSTL C., & TAILLIEU T. (2008), Towards a Relational Concept of Uncertainty: about Knowing Too Little, Knowing Too Differently, and Accepting Not to Know. *Ecology and Society* 13(2), pp. 30. <http://www.ecologyandsociety.org/vol13/iss2/art30/> [Last accessed on 01-02-2017]
- CHOULARTON R. (2001), Complex learning: organizational learning from disasters. *Safety Science* 39(1-2), pp. 61-70.
- CRETNEY R.M., & BOND S. (2016), Shifting relationships to place: a relational place-based perspective on SES resilience. *Urban Geography* 38(1). DOI: 10.1080/02723638.2016.1139865 [Last accessed on 01-09-2017]
- CUTTER S.L., BARNES L., BERRY M., BURTON C., EVANS E., TATE E., & WEBB J. (2008), A place-based model for understanding community resilience to natural disasters. *Global Environmental Change* 18(4), pp. 598-606.
- DAVOUDI S., BROOKS E., & MEHMOOD A. (2013), Evolutionary resilience and strategies for climate adaptation. *Planning Practice and Research* 28(3), pp. 307-322.
- DAVOUDI S., SHAW K., HAIDIR L.J., QUILAN A.E., PETERSON G.D., WILKINSON C., FÜNFELD H., McEVoy D., & PORTER L. (2012), Resilience: A Bridging Concept or a Dead End? "Reframing" Resilience: Challenges for Planning Theory and Practice; Interacting Traps: Resilience Assessment of a Pasture Management System in Northern Afghanistan; Urban Resilience: What Does it Mean in Planning Practice? Resilience as a Useful Concept for Climate Change Adaptation? The Politics of Resilience for Planning: A Cautionary Note. *Planning Theory & Practice* 13(2), pp. 299-333.
- DEVERTEUIL G., & GOLUBCHIKOV O. (2016), Can Resilience be redeemed? Resilience as a metaphor for change, not against change. *City* 20(1), pp. 143-151.
- FOLKE C. (2006), Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change* 16, pp. 253-267.
- GEROMETTA J., HAUSSERMANN H., & LONGO G. (2005), Social Innovation and Civil Society in Urban Governance: Strategies for an Inclusive City. *Urban Studies* 42(11), pp. 2007-2021.
- GUNDERSON L. (2010), Ecological and human community resilience in response to natural disasters. *Ecology and Society* 15(2), p. 18. <http://www.ecologyandsociety.org/vol15/iss2/art18/> [Last accessed on 01-06-2017]
- HAAS J.E., KATES R., & BOWDEN M. (eds.), (1977), *Reconstruction following Disaster*. Cambridge, MA and London, UK, MIT Press.
- IBERT O. (2007), Towards a Geography of Knowledge Creation: The Ambivalence between "Knowledge as an Object" and "Knowing in Practice". *Regional Studies* 41(1), pp. 103-114.
- IPCC (2014), Summary for policymakers. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*.

- JOHNSON L., & HAYASHI H. (2012), Synthesis efforts in disaster recovery research. *International Journal of Mass Emergencies and Disasters* 2, pp. 212-238.
- JOSHI A., & AOKI M. (2014), The role of social capital and public policy in disaster recovery: A case study of Tamil Nadu State, India. *International Journal of Disaster Risk Reduction* 7, pp. 100-108.
- KAMOCHE K., PINA E CUNHA M., & VIEIRA DA CUNHA J. (2003), Towards a Theory of Organizational Improvisation: Looking Beyond the Jazz Metaphor. *Journal of Management Studies* 40(8), pp. 2023-2051.
- KHAKEE A., BARBANENTE A., & BORRI D. (2000) Expert and experiential knowledge in Planning. *The Journal of the Operational Research Society* 51(7), pp. 776-788.
- LANZARA G.F. (1983), Ephemeral Organizations in Extreme Environments: Emergence, Strategy, Extinction. *Journal of Management Studies* 20(1), pp. 71-95.
- LANZARA G.F. (1993), Capacità negativa: competenza progettuale e modelli di intervento nelle organizzazioni. Bologna, Il Mulino Ricerca.
- MACKINNON D., & DERICKSON K.D. (2013), From resilience to resourcefulness: A critique of resilience policy and activism. *Progress in Human Geography* 37(2), pp. 253-270.
- MAGIS K. (2010), Community resilience: An indicator of social sustainability. *Society & Natural Resources* 23, pp. 401-416.
- MCCARTHY D.D.P., CRANDALL D.D., WHITELAW G.S., GENERAL Z., & TSUJI L.J.S. (2011), A Critical Systems Approach to Social Learning: Building Adaptive Capacity in Social, Ecological, Epistemological (SEE) Systems. *Ecology and Society* 16(3), p. 18. <https://www.ecologyandsociety.org/vol16/iss3/art18/> [Last accessed on 01-10-2017]
- MEHMOOD A. (2016), Of resilient places: planning for urban resilience. *European Planning Studies* 24(2), pp. 407-419.
- MOYNIHAN D.P. (2009), From Intercrisis to Intracrisis Learning. *Journal of Contingencies and Crisis Management* 17(3), pp. 189-198.
- MOULAERT F. (2009), Social Innovation: Institutionally Embedded, Territorially (Re)produced. In: MACCALLUM, D., MOULAERT, F., HILLIER, J., & VICARI HADDOCK, S. (eds.), *Social Innovation and Territorial Development*. London and New York, Routledge, pp. 11-22.
- MOULAERT F., SWYNGEDOUW E., MARTINELLI F., & GONZÁLEZ S. (2005), Towards Alternative Model(s) of Local Innovation. *Urban Studies* 42(11), pp. 1969-1990.
- MURO, M., & JEFFREY, P. (2008), A critical review of the theory and application of social learning in participatory natural resource management processes. *Journal of Environmental Planning and Management* 51(3): 325-344.
- NAKAGAWA Y., & SHAW R. (2004), Social Capital: A Missing Link to Disaster Recovery. *International Journal of Mass Emergencies* 22(1), pp. 5-34.
- NORRIS F.H., STEVENS S. P., PFEFFERBAUM B., WYCHE K.F., & PFEFFERBAUM R.L. (2008), Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology* 41(1-2), pp. 127-150.
- O'BRIEN G., O'KEEFE P., GADEMA Z., & SWORDS J. (2010), Approaching disaster management through social learning. *Disaster Prevention and Management* 19(4), pp. 498-508.
- OLSHANSKY R. (2005), How do Communities Recover from Disaster? A Review of Current Knowledge and an Agenda for Future Research. *46th Annual Conference of the Association of Collegiate Schools of Planning*, pp. 1-9.
- OLSHANSKY R. (ed.), (2017), *Urban Planning After Disasters: Critical Concepts in Built Environments*. New York, Routledge.

- OLSHANSKY R., & CHANG S. (2009), Planning for disaster recovery: emerging research needs and challenges. In: BLANCO H., & ALBERTI M. (eds.). Special issue: Shaken, shrinking, hot, impoverished and informal: Emerging research agendas in planning. *Progress in Planning* 72, pp. 200-209.
- OLSHANSKY R., HOPKINS L., & JOHNSON L. (2012), Disaster and Recovery: Processes Compressed in Time. *Natural Hazards Review* 13(3), pp. 173-178.
- PELLING M., SHARPE J., PEARSON L., ABELING T., SWARTLING A.G., FORRESTER J., & DEEMING H. (2015), Social Learning and Resilience Building in the emBRACE framework. Deliverable 4.3. <http://www.embrace-eu.org/outputs> [Last accessed on 01-10-2017]
- PERRY R., & QUARANTELLI E. (eds.), (2005), What is a disaster? New answers to old questions. Bloomington, Xlibris.
- PESARESI M., EHRLICH D., KEMPER T., SIRAGUSA A., FLORCZYK A.J., FREIRE S., & CORBANE C. (2017), Atlas of The Human Planet 2017: Global Exposure to Natural Hazards. EC Joint Research Centre. <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/atlas-human-planet-2017-global-exposure-natural-hazards> [Last accessed on 01-09-2017]
- QUARANTELLI E. L. (1999), The Disaster Recovery Process: What We Know And Do Not Know From Research. Newark, Disaster Research Center, University of Delaware Publisher.
- REED M.S., EVELY A.C., CUNDILL G., FAZEY I., GLASS J., LAING A., NEWIG J., PARRISH B., PRELL C., RAYMOND C., & STRINGER L. C. (2010), What is Social Learning? *Ecology and Society* 15(4), resp. 1. <https://www.ecologyandsociety.org/vol15/iss4/resp1/> [Last accessed on 01-09-2017]
- RUBIN C. (1985), Community Recovery from a Major Natural Disaster. Monograph 41. Boulder, Colorado. *Program on Environment and Behavior, Institute of Behavioral Science, University of Colorado.*
- SCHÖN D.A. (1983), The Reflective Practitioner: How Professionals Think in Action. New York, Basic Books.
- SCHWAB J. (ed.) (2014), Planning for Post-Disaster Recovery: Next Generation. Chicago, American Planning Association Press.
- SMITH P.S., & WENGER D. (2007), Sustainable Disaster Recovery: Operationalizing An Existing Agenda. In: RODRIGUEZ H., QUARANTELLI E.L., & DYNES R.R. (eds.), *Handbook of Disaster Research*. New York, Springer, pp. 234-257.
- TIDBALL K.G., KRASNY M.E., SVENDSEN E., CAMPBELL L., & HELPHAND K. (2010), Stewardship, learning, and memory in disaster resilience. *Environmental Education Research* 16(5-6), pp. 591-609.
- TIERNEY K. (2013), "Only Connect!" Social Capital, Resilience, and Recovery. *Risk, Hazards & Crisis in Public Policy* 4(1), pp. 1-5.
- TIERNEY K., & OLIVER-SMITH A. (2012), Social Dimensions of Disaster Recovery. *International Journal of Mass Emergencies and Disasters* 20(2), pp. 123-146.
- TOPPING K.C., & SCHWAB J. (2014), Disaster Recovery Planning: Expectations versus Reality. In: SCHWAB J. (ed.), *Planning for Post-Disaster Recovery: Next Generation*. Chicago, American Planning Association Press, pp. 42-59.
- UNISDR (2015), Sendai Framework for Disaster Risk Reduction 2015-2030. <http://www.unisdr.org/we/inform/publications/43291> [Last accessed on 01-10-2017].
- VALE L.J. (2014), The Politics of Resilient Cities: Whose Resilience and Whose City? *Building Research and Information* 42(2), pp. 191-201.

- VALE L.J., & CAMPANELLA T.J. (eds.), (2005), *The Resilient City: How Modern Cities Recover from Disaster*. Oxford, Oxford University Press.
- VALLANCE S., & CARLTON S. (2015), First to respond, last to leave: Communities' roles and resilience across the "4Rs". *International Journal of Disaster Risk Reduction* 14, pp. 27-36.
- WILKINSON C. (2011), Social-ecological resilience: Insights and issues for planning theory. *Planning Theory* 11(2), pp. 148-169.