MULTIADAPTIVE PLACES FOR MULTIRISK RESILIENCE

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Multiresilience and multiadaptation

Marichela Sepe

Resilience and Adaptation are two conceptually close and deeply interrelated notions that share numerous commonalities, as can already be inferred from what follows; for this reason, they are presented and discussed here in conjunction (Sepe, 2023). Zolli and Healey's (2012) definition of resilience as "the ability of a system, firm, or person to maintain its core purpose and integrity in the face of dramatically changed circumstances" brings together ecological and sociological perspectives and clearly reveals the intrinsically multidisciplinary nature of the topic, a multidisciplinarity that has been further explored in the debate on the relationship between social and ecological resilience (Adger, 2009; Meerow et Al., 2016).

In many cases, resilience approaches tend to treat the events that trigger crises in a system as if they were comparable, even when their characteristics differ substantially, and often fail to distinguish between sudden events and undesired or slowly evolving ones, giving rise to a number of ambiguities. Among these, for example, the absence of a clearly specified pathway through which resilience should be pursued implies that the degree of resilience displayed by communities after an abrupt event may vary considerably, and even within the same community heterogeneous

responses and behaviours may emerge, depending on cultural, social, and organisational factors (Chanlat, Davel, Dupuis, 2013).

Adopting an evolutionary perspective (Bohland et al., 2019; Davoudi et al., 2013; Russo, 2018), ecology is no longer seen as governed by a single equilibrium, but rather by a plurality of possible equilibria; however, the crucial question becomes the nature of the equilibrium that is taken as a reference, rather than the set of causes that may disturb or transform it. A social or cultural crisis, for instance, must be addressed with approaches that differ from those required in the aftermath of an environmental catastrophe, and even crises of the same general type may differ in the duration of their effects and in the response times they presuppose (Paton, Johnston, 2001). The multidimensional character of resilience renders the concept at once flexible and adaptable, yet also elusive in its full scope and complexity, thus calling for continuous refinement and further investigation (Vale, Campanella, 2005). Current research tends to focus primarily on environmental risks and, more recently, on risks associated with epidemics, as in the case of Covid-19, thereby making the underlying issues more visible (Komendantova et al., 2016).

At the same time, as Vale (2014) observes, resilience is invoked in multiple fields in comparable ways. Management scholars use resilience to evaluate a firm's capacity to recover from the disruption of a key component and resume ordinary functioning; economists refer to it when analysing the ability of a locality to recover following the loss of a strategic industry; ecologists are concerned with the capacity of an ecosystem to return to a previous equilibrium after a sudden environmental shock (Banica et al., 2020; Borsekova, Nijkamp, 2019; Bănică, Istrate, Benea, 2020; Tschakert, Dietrich, 2010); psychologists use the notion to describe an individual's ability to withstand trauma and continue to function adequately, in line with broader reflections on risk perception and emotional responses to uncertainty (Lopes, 1987). Information technology specialists, in turn, assess the resilience of a communication network in terms of how effectively it copes with a failure, such as a large-scale power outage.

Transposing the concept of resilience to socio-environmental systems such as cities entails anticipating crises and reinforcing urban systems through proactive solutions capable of enhancing both public and private spaces. Preventive resilience, however, requires choices that involve advance expenditure and investment, as well as decisions about which populations and places are exposed to risk and ought therefore to be prioritised for protection, irrespective of whether the hazards are anthro-

pogenic, natural, or the outcome of their interaction (Birkmann, 2013; Cutter et al., 2003; Folke, et al. 2010; Holling, 1973; Kaplan, Garrick, 1981; Mahmoud et al., 2022; Serre et al., 2012). A comprehensive and holistic understanding of preventive resilience should therefore incorporate the needs of all stakeholders and the diversity of urban and territorial contexts potentially affected, as emphasised by international policy frameworks such as the New Urban Agenda (UN Habitat, 2016) and the Sustainable Development Goals (UN DESA, 2015).

Resilience is also closely associated with the notion of safety, in the sense that a resilient environment is one in which people can live securely within spaces whose quality has been improved (Zelinka, Brennan, 2001). Cities, in fact, are not homogeneous landscapes in which people are randomly distributed, but structured environments that produce and reproduce socio-economic differences; for this reason, it is difficult to describe an entire city as uniformly resilient. The Covid-19 pandemic, for instance, generated issues of safety, vulnerability, and unequal resilience not only between different cities, but also between neighbourhoods and areas within the same urban context, highlighting the role of public space quality and flexibility in supporting healthier and more inclusive environments (Sepe, 2021; Francis et al., 2012).

Moreover, informal urban settlements and marginal spaces tend to be more exposed to risk because they often lack adequate infrastructure and services and host large populations facing socio-economic hardship, a condition that can give rise to a wide spectrum of vulnerabilities and to comparatively lower levels of resilience, particularly in terms of health and access to essential urban services (Opdam, 2020).

Uncertainty represents another crucial dimension in the analysis of resilience, since the limited knowledge available about future crises—environmental or otherwise—makes communities and places particularly vulnerable. To reduce the impacts associated with uncertainty regarding future events, policies and instruments for urban risk planning and management need to be considered ex ante, acknowledging the intrinsic limits of prediction in complex systems (Parry, 1996). Incorporating uncertainty within planning processes and strengthening cooperation among institutions and organisations, both public and private and at different scales, are essential components of a resilient approach. Similarly, social diversity must be recognised and addressed with the aim of reducing disparities through a more balanced distribution of resources that foster resilience.

Resilient planning should therefore be oriented toward uncertainty and move beyond traditional approaches, preparing cities for multiple possible trajectories of change. Adaptation, in this sense, is crucial for limiting the damage produced by climate change and, more broadly, by economic, social, and health crises. Planning processes should consider a broader range of conditions and, in particular, develop both ex-ante and ex-post assessments in order to adapt more effectively to sudden and unforeseen situations.

Another dimension associated with uncertainty concerns sustainable urban form, which relates to several aspects of resilience: liveability, urban health, social and cultural change, climate, and multiculturalism are only some of the elements shaping contemporary public policies and must be considered in the pursuit of a high-quality urban form (Lynch, 1984; Sepe, 2023). Compact and contiguous development, high-density layouts, sustainable transport and fair accessibility, mixed land uses, diversity in housing and building types, passive solar design, urban greening (particularly in dense cities), and the renewal and adaptive reuse of brownfield sites are among the key criteria used to assess the sustainability of urban form (Jabareen, 2006, 2013).

In this regard, Desouza and Flanery (2013) note that the social sphere is composed of three main elements: people; institutions, understood as collectives of individuals who converge toward common goals; and activities, meaning the tasks that people and institutions design, perform, and utilise. Within this framework, people play the central role, since it is around them that the other two components are organised. In addition, the physical and social spheres frequently overlap, and many urban activities emerge precisely from their intersection. In public spaces, for example, it is possible to observe interactions among different individuals, activities (such as walking), institutions (such as services), processes (such as various forms of permitting), and resources (including artworks and artefacts of different kinds). Each of these components interacts in both intentional and unintentional ways, and identifying such interactions is crucial for designing places that are both resilient and adaptive (Desouza, Flanery, 2013).

Spaces characterised by a high degree of resilience are those capable of adjusting to change. Yet adaptivity, like resilience, is a notion that lacks a single, unequivocal interpretation (De Roo, Porter, 2007). To delineate its boundaries in the field of planning, this domain can be related (De Roo et al., 2020) to the material dimension, on the one hand, and to organisational and institutional dimensions, on the other. The material dimension

concerns people, the environment, and land, whereas the organisational and institutional dimensions refer to the arenas in which planning and associated activities operate to link institutions with the material sphere. Adaptive planning may thus imply that the people, places, or situations that constitute the objects of planning exhibit dynamic behaviours that can reappear in the future, or that the processes through which interventions are designed and implemented are themselves capable of evolving adaptively (Leichenko, 2011; Pelling, 2011).

Conventional planning approaches generally do not regard adaptive behaviour as a starting premise. They address situations that call for interventions determined ex post through planning actions, such as the construction of a new road to alleviate worsening traffic congestion or the development of a residential district in response to population growth. Yet these issues could, at least in principle, have been tackled earlier within the planning process; traditional planning, however, is mainly oriented towards present conditions rather than towards unforeseen transformations.

The uncertainty and unpredictability of an event and of its subsequent, often unknown, evolution are difficult to manage. A system cannot, in fact, be fully understood solely by examining the individual components that constitute it; instead, these must be analysed together with their broader context, paying attention to reciprocal relationships and to the ways in which the system tends towards a configuration that is, at any given time, the most viable.

As aforementioned, traditional approaches assumes that urban interventions can be decided on the basis of the facts and projections available at the time decisions are taken. If reality were to remain stable or evolve only along predictable paths, there would be little reason to abandon this form of planning. Such an approach, however, rests on a static perspective that assumes transformations to follow foreseeable trajectories, grounded in three starting points: the "actual", that is, the elimination of the anomaly responsible for a disturbed order in the here and now; the "desired", meaning the ideal condition and evidence provided by the context; and the "potential", namely the instruments through which a predefined and commonly agreed objective can be reached.

This static perspective is still present in contemporary planning practices, where intentional actions are expected to produce the outcomes envisaged by decision-makers. Nonetheless, the presumption of a relatively static world may generate strategies that have already become obsolete

by the time decisions are implemented, thus creating a substantial gap between anticipated and actual effects.

Resilience and adaptation should therefore be regarded as fundamental principles within dynamic planning frameworks, in which uncertainty and sudden change become components of the planning process with the same relevance as other factors, and in which planning tools are updated or redesigned to contribute more effectively to the management of crises. While unforeseen events, by definition, occur unexpectedly, adaptive and dynamic planning can nonetheless provide more robust support for the emergence of new and more stable equilibria.

Accordingly, urban regeneration should be based on an integrated approach that combines vision and action to address multiple problems affecting disadvantaged urban areas, with the aim of improving their socio-economic, physical, and environmental conditions through measures such as rehabilitation, recovery, and heritage conservation (Zheng et al., 2017). The notion of regeneration must be complemented by that of sustainability (Nijkamp, Perrels, 1994), interpreted in its threefold meaning (Sepe, 2020a, 2020b; Sepe, 2023, 2025), although, as Evans and Jones (2008) point out, this conjunction may create ambiguity regarding the relative weight to be assigned to environmental, social, and economic dimensions. In practice, greater emphasis in regeneration processes may be placed on one component rather than another, depending on the priorities and objectives of developers (Astleithner et al., 2004; Davies, 2002).

Recent studies have identified further key elements of sustainability with respect to the planning system, including: social cohesion and inclusion; protection and enhancement of the natural environment; prudent use of natural resources; sustainable economic growth; and the integration of sustainable development principles into planning instruments (ODPM, 2004). This underscores the importance of integrating these dimensions, rather than merely ensuring their formal presence (Forrester, Snell, 2007; Walker, Salt, 2006).

In this context, it may be useful to introduce the notion of multiresilience (Sepe, 2022), understood as the capacity of a system to respond to situations characterised by the co-presence of multiple risks and, taking into account the specific qualities of the place, the attributes of individual risks, and the inclusive participation of different actors, to return to its initial condition.

In continuity with the ideas outlined above, and alongside multiresilience, it is equally useful to define the concept of multiadaptation, that is, the ability of a system to react to multirisk and unexpected situations by establishing a new equilibrium capable of incorporating territorial specificities, risk typologies, involved stakeholders, and emerging needs within an inclusive perspective (Sepe, 2022).

These definitions provided the conceptual framework for the development of an analytical and design method that led to the formulation of principles for the design of places oriented toward multirisk resilience and adaptation.

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