Chapter 1
Post-pandemic Challenges. The Role of Local Governance for Territorial Resilience

Grazia Brunetta and Angioletta Voghera

Abstract This chapter aims to provide researchers different interpretative keys of the book, which attempt to propose methodologies, tools, and case studies to put resilience into action in post-pandemic territories by planning and design at different scales. The chapter opens the discussion by presenting diverse and interdisciplinary contributions of which the research is composed; it discusses key topics with reference to the transformative resilience, and referring to methodologies and tools for interpreting territories, and focusing on the role of planning, as well as attempting to describe through practices the operational concept of the Local Resilience Unit.

Keyword Territorial resilience · Local resilience unit · Methodologies · Case studies

1.1 Framing Territorial Resilience

What is the role of urban and regional planning in achieving sustainable development goals of our communities, considering the turning point for spatial planning posed by the COVID-19 emergency? Moreover, how do medium and long-term planning purposes interact with the needs that the pandemic has boosted?

The book *Post Un-Lock—From territorial vulnerabilities to local resilience* aims to provide the reader with a valuable tool to understand how the COVID-19 pandemic should be a trigger for the re-start based on a new territorial path in the frame of sustainability and resilience.

As shared among scholars, sustainability and resilience are two related visions. They are two umbrella issues that cannot be used as interchangeable notions, since

G. Brunetta · A. Voghera (✉)
DIST—Interuniversity Department of Regional and Urban Studies and Planning,
R3C—Interdepartmental Responsible Risk Resilience Centre, Politecnico di Torino, Torino, Italy
e-mail: angioletta.voghera@polito.it

G. Brunetta
e-mail: grazia.brunetta@polito.it

resilience can be considered a subsystem of the sustainability approach (Folke et al. 2016; Brunetta and Caldarice 2020) or a renewed and systemic attitude in the sustainability science (Xu et al. 2015). Sustainability and resilience have some differences (Voghera and Giudice 2019): sustainability promotes general aims of social justice, environmental protection, and economic efficiency through a radical re-organization of the socio-ecological system; resilience is focused on the need for change, adaptation, and transformation of territorial systems, evolving in time and space following the socio-ecological demands and overcoming the socio-ecological limits. Besides, they have shared features, e.g., supporting the integration of environmental management into territorial and urban planning, reinforcing reflectiveness, flexibility, and inclusiveness in planning processes, and valorizing the robustness and diversity of ecological and landscape values.

Territorial innovation is required to guarantee sustainability, resilience, and the related ecological transition. This pathway implies the "bounce forward" of territorial systems, demanding them to evolve in a post-COVID process of change. This bounce calls for the re-design of new planning solutions. Moreover, it is necessary to renew the current tools, as well as to adopt new approaches, including technological ones, an envisage actions and policies for the resilience of territories (Voghera 2020). Assuming a strengthened definition, the IPCC (2012) frames resilience as "*the ability of a system and its component to anticipate, absorb, accommodate or recover from the effects of a hazards in a timely and efficient way, including by ensuring the preservation, restoration or enhancement of its essential basic structures and functions.*" In this rationale, the territorial dimension is an integrated layer, and "territorial resilience" can be described as "*an emerging concept (…) that considers the dynamic and nonlinear interaction between endogenous features of systems and their exogenous transient shocks, chronic stresses, and their conditions of sudden or slow change that affect both assets and governance systems*" (Brunetta et al. 2019, p. 10). This definition emphasizes the territorial ability to respond, transform, and co-evolve into a different perspective without rebounding back after the pandemic event (Giovannini et al. 2020). This latter definition, the so-called transformative resilience, should take advantage of the environmental, economic, climate, and social crises, and reconsider planning and design processes.

The Post Un-Lock research supports a jump forward on "territorial resilience" based on interpreting the "inherent unpredictability" of the pandemic and post-pandemic times (Folke et al. 2021, p. 19). This complex leap ahead should enable to reorganize of territorial systems, starting from the awareness of interrelation among all their components—such as economic, social, ecological, energy, climate, and health—and following the directions drafted by the UN Agenda 2030 (Agenda for Sustainable Development, 2015) and by the different European Next Generation EU Plans (in Italy the PNRR).

Spatial policies assume a leading role in sustainable and resilient development. They have not only considered system dynamics but also encouraged our collective capacity to guide development trajectories in a responsive, adaptive, and reflective way (Freeman et al. 2020). What is needed is a process that moves towards nature-based recovery or towards a nature-positive economy (IUCN Marseille Congress

2021 "Our Nature, Our Future"). This process should be based on the integration of site-based conservation and development (see Chap. 3) as a path to rewriting the alliance between humans and nature, reversing the paradigms of the past 100 years (today, 0.01% of living things have been able to produce materials/objects/waste equal to the mass of all living things; "Great Acceleration"; Elhacham et Al. 2020).

Considering territorial governance to implement SDGs 3, 11, 13, 14, and 15 required a significant acceleration by integrating the ecological transition into planning and management at different scales (from the global consciousness to the local action).

Radical changes in spatial planning at different scales are the basis of transformative resilience. The demand for innovation has been discussed for thirty years in spatial planning. Otherwise, planning has produced partial, sectorial, and fragmented responses to the demands for innovation. Planning has attempted to pay attention to many issues, such as land consumption, energy conversion of the built environment, ecological and landscape design, social services, and transportation. These attentions have not yet produced different organizations of territories concerning the environment and landscape to ensure health, safety, and well-being.

With this in mind, the research tried to answer the following emerging questions:

- We are certainly on a proactive ground, but do we have appropriate cognitive and planning tools for the complex challenges and goals for ecological transition and resilience?
- What is the role of planning in driving these goals to action?
- Can planning lead to effective ecological transition actions?

In a nutshell, the COVID-19 experience highlights the need to suggest a planning system that can integrate multiple scales according to an interdisciplinary approach focused on deep knowledge of territorial risks and vulnerabilities.

1.2   Territorial Resilience. Does the Scale Matter?

The operationalization of spatial resilience at different planning scales depends on local conditions and specific spatial policy objectives. Within the framework of international agreements, it is now clear that territorial resilience, to be effective, must reinforce a multiscalar governance approach. Vertical integration should address how local action contributes to international and national policy goals and how national governments can sustain local action (Caldarice et al., 2021).

From a practical point of view, the EU Green Deal (2019) represents the first attempt to decline resilient thinking into public policy, promoting multiscalar policies to develop a climate-neutral development model by 2050 both at the regional and at the local scales.

At the regional scale, territorial resilience should be the frame of a strategic vision that fields a network of policies based on shared agreements between stakeholders and institutions, capable of supporting the empowerment and accountability of each actor, guaranteeing the adequacy of regional planning tools, and identifying economic resources to integrate the climate transition to resilience into decision-making processes (Brunetta 2015).

At the local scale, territorial resilience should be the lead for the territorial regulatory framework to support design actions that sustain a green and equitable transition. The current situation requires new paradigms and approaches for territorial governance design, aiming to link measures to reduce territorial vulnerabilities with strategies and interventions to guide territories' transformation, maintenance, and territorial regeneration design. Territorial resilience requires two equally considered dimensions, the strategic and the local, which must work together in circular and mutual processes (Coscia and Voghera 2022, 2023). These two " drivers" of territorial resilience imply innovative cognitive frameworks in decision-making, from analysis of territorial vulnerabilities to planning actions.

During the COVID-19 emergency, the "local resilience unit" emerged as a resilient answer at the local scale, emphasizing the role of community proximity and the liveability of urban spaces and facilities. In this book, the local resilience unit—that is a specific outcome of the research—can be defined as "an operational frame" at the "neighbourhood" level that can develop planning actions together with community empowerment to make cities more responsive, resilient, and able to provide a high level of liveability and urban well-being. Of course, this is not a completely new planning paradigm. The Local Resilience Unit stems from an ideal–typical model of territorial organization based on civic subsidiarity that can provide an operational key to integrate local demands, local self-organization, and the responses of public institutions (Brunetta and Moroni 2012).

Building on this theoretical overview, the book brings together several contributions that address various open issues, e.g., understanding spatial, landscape, environmental, and climate dynamics, analysing local vulnerabilities, and using modern survey techniques and tools to produce planning support. By proposing the Local Resilience Unit, Post Un-Lock is taking a step towards defining a new spatial planning paradigm that deals with territorial transformative resilience, aiming at supporting the implementation of innovative practices and actions for overcoming territorial vulnerabilities.

1.3 Converging Experimentations: Challenges, Methodologies, and Tools for Post-pandemic Territories and Cities

The book presents the results of work carried out by researchers at the Polytechnic and University of Turin who collaborated in the "*POST-UN-LOCK. From territorial vulnerabilities to local resilience*" research program.[1] The project's main objective is to decline through case study a first conceptual definition of "local resilience units," and, more broadly, of planning for resilience in the post-pandemic period. In this perspective, there is a strong focus on the definition of a new paradigm focused on the importance of local and "sub-local" planning, considered as the output of a deep relationship between territories and the knowledge paradigm. The concept of Local Resilience Unit is a recent topic that is still open in the literature. It is intended as a "micro-territory" capable of responding to shocks, the Local Resilience Unit is linked to the concept of neighbourhood unit, superblock, and 15 Minute city. It should be understood not only as a form of optimal distribution of essential services, organized and planned for enabling communities to overcome crisis through an adaptive approach, reinventing the territorial proximity.

The aim is to provide, through the concept of a resilience unit and an integrated reading of risks and vulnerabilities, an operational framework for post-COVID planning. The objective is to provide, on the one hand, ideas for an integrated interpretation of territorial risks and vulnerabilities and, on the other, practical and theoretical models for the post-COVID city, capable of reorganizing itself to pursue long-term sustainability and resilience. In this process of definition, it is necessary to work at different scales, considering how a specific system of risks to which a resilience unit is subjected is the result of the interaction of local and supra-local phenomena. Moreover, the response to these risks involves site-specific actions that require a high level of territorial awareness at different scales and the integration of policies among different levels of government and between different spheres according to a multiscalar and transdisciplinary approach.

The research POST UN-LOCK provides a wide range of reflections dealing with methodologies, approaches, and tools experimented on different territories: the Piedmont Region, the Metropolitan City of Turin, the Stura River, and the Lanzo Valley territory.

The work of the researchers in the book was organized into three sections: topics, case studies, and digital tools.

The section **Topics** tries to define some main issues for the resilient city critically interpreted through diverse qualitative and quantitative methodologies used to analyse the territory. It explores some specific aspects:

- the spatial analysis of the COVID-19 pandemic and its effect on Piedmont municipalities (Chap. 2);

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[1] The research POST-UNLOCK. From territorial vulnerabilities to local resilience was financed by DIST Department in 2020.

- an interpretation of hydrological, ecological, and ecosystem features of the territory (Chap. 3);
- the ecological network and ecosystem services for territorial resilience (Chap. 4);
- an evaluation of sustainability at the local level (Chap. 5);
- an interpretation of the concept of neighbourhood concerning the minimum resilience units (Chap. 6).

The section **Case Studies** develops reflections on various territorial scale (from the metropolitan to the neighbourhood scale) reflecting on specific aspects, such as NO2 concentrations and COVID-19 in Turin Municipality (Chap. 7); the pandemic event in mountain areas compared to the metropolitan area (Chap. 8); risks and climate change in North Turin metropolitan area (Chap. 9); experimentations for landscape resilience at local level (Chap. 10); the school and social innovation for territorial resilience and Local Resilience Unit (Chap. 11).

The **Digital Tools section** describes experimentations that are essential to developing the resilient challenges and investigating specific interpretation tools, considering 3D metric surveys for the digital cartographic production (Chap. 12), and the role of sources and data for the analysis used by GIS tools (Chap. 13).

Some finals remarks and perspectives are reported in Chap. 14.

The analysis and studies of the territory, which are also conducted with the help of GIS methodologies (in the three parts of the book topic, case studies, and digital tools), are essential for the knowledge on both the large and local scales of local risks and vulnerabilities. Besides, those tools have a crucial role in constructing theoretical (and critical) interpretations of the main problems and solutions that can converge in the "local resilience unit" concept.

References

Brunetta G (ed) (2015) Smart evaluation and integrated design in regional development. Territorial scenarios in Trentino, Italy. Ashgate, Farnham

Brunetta G, Caldarice O (2020) Spatial resilience in planning: meanings, challenges, and perspectives for urban transition. In: Leal Filho W, Azul A, Brandli L, Özuyar P, Wall T (eds) Sustainable cities and communities. Encyclopedia of the unsustainable development goals, vol III. Springer International Publishing, Cham, pp 1–12. ISBN: 9783319957166. https://doi.org/10.1007/978-3-319-95717-3_28

Brunetta G, Moroni S (2012) Contractual community in the self-organising City. Freedom, Creativity, Subsidiarity. Springer, Dordrecht

Brunetta G, Ceravolo R, Barbieri CA, Borghini A, de Carlo F, Mela A, Beltramo S, Longhi A, De Lucia G, Ferraris S, Pezzoli A, Quagliolo C, Salata S, Voghera A (2019) Territorial resilience: toward a proactive meaning for spatial planning. Sustainability 11(8):2286, 17, ISSN 2071-1050. https://doi.org/10.3390/su11082286. www.mdpi.com/journal/sustainability

Caldarice O, Tollin N, Pizzorni M (2021) The relevance of science-policy-practice dialogue. Exploring the urban climate resilience governance in Italy. City, Territory Archit 8:1–11, ISSN: 2195-2701. https://doi.org/10.1186/s40410-021-00137-y

Coscia C, Voghera A (2022) Co-evolutionary, transformative, and economic resilience during the COVID-19 pandemic crisis. Evidence-based experiences of urban community design in Turin

(Italy). In: Calabrò F, Della Spina L, Piñeira Mantiñán MJ (eds) Lecture notes in networks and systems. new metropolitan perspectives—post covid dynamics: green and digital transition, between metropolitan and return to villages perspectives, vol 2. Springer, Cham, Berlino. https://doi.org/10.1007/978-3-031-06825-6_271

Coscia C, Voghera A (2023) Resilience in action: The bottom up! architecture festival in Turin (Italy). J Safety Sci Resilience 4(2):174–187. https://doi.org/10.1016/j.jnlssr.2022.10.005

Elhacham E, Ben-Uri L, Grozovski J et al (2020) Global human-made mass exceeds all living biomass. Nature 588:442–444. https://doi.org/10.1038/s41586-020-3010-5

Folke C, Biggs R, Norström AV, Reyers B, Rockström J (2016) Social-ecological resilience and biosphere-based sustainability science. Ecol Soc 21(3):41. https://doi.org/10.5751/ES-08748-210341

Folke C, Polasky S, Rockström J et al (2021) Our future in the Anthropocene biosphere. Ambio 50:834–869. https://doi.org/10.1007/s13280-021-01544-8

Freeman J, Baggio JA, Coyle TR (2020) Social and general intelligence improves collective action in a common pool resource systems. Proc Natl Acad Sci 117(14)

Giovannini E, Benczur P, Campolongo F, Cariboni J, Manca A (2020) Time for transformative resilience: the COVID-19 emergency. Publications Office of the European Union, Luxembourg. https://doi.org/10.2760/062495

IPCC (2012) Glossary of terms. In: Managing the risks of extreme events and disasters to advance climate change adaptation. In: Field CB, Barros V, Stocker TF, Qin D, Dokken DJ, Ebi KL, Mastrandrea MD, Mach KJ, Plattner G-K, Allen SK, Tignor M, Midgley PM (eds) A special report of working groups I and II of the intergovernmental panel on climate change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp 555–564

Voghera A, Giudice B (2019) Evaluating and planning green infrastructure: a strategic perspective for sustainability and resilience. Sustainability 11(10):2726, 21, ISSN 2071-1050. https://doi.org/10.3390/su11102726. https://www.mdpi.com/2071-1050/11/10/2726/htm

Voghera A (2020) The river agreement in Italy. Resilient planning for the co-evolution of communities and landscapes. Land Use Policy 91. Press, available online 30 November 2019, published February 2020, ISSN: 0264-8377, https://doi.org/10.1016/j.landusepol.2019.104377

Xu L, Marinova D, Guo X (2015) Resilience thinking: a renewed system approach for sustainability science. Sustain Sci 10:123–138. https://doi.org/10.1007/s11625-014-0274-4