Fragility and Antifragility in Cities and Regions

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Space, Uncertainty and Inequality

Edited by

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Introduction to *Fragility and Antifragility in Cities and Regions*

Francesco Curci and Daniele Chiffi

The past two decades have been characterised by a series of economic downturns, health crises, natural and man-made disasters, wars and terrorist attacks that have had a profound impact on both specific regions and the world as a whole. The human population has doubled in just 50 years, making us more aware of the many hazards and vulnerabilities that put human settlements and societies at risk, regardless of location or time. In the third millennium, the increasing frequency of climate, financial, political and health crises resulting from population growth, globalisation and urbanisation has challenged both economic development and risk management paradigms. The prevalence of severe forms of uncertainty rather than probabilistic forms of risk has emerged as a critical issue in the face of enduring turbulence and disruptive events. Furthermore, it is clear that socio-economic disparities have contributed to many traumatic events and exacerbated different forms of socio-spatial polarisation.

Based on research into the concepts of fragility and antifragility (Taleb 2012; Aven 2015), this book explores how to effectively manage severe uncertainty and socio-spatial inequalities, with a focus on architecture, urban planning and policy. The contributors to this book, coming from various disciplines, examine how fragility and antifragility impact upon contemporary cities and regions, providing insights into how these concepts can help to reimagine traditional rationality in public action and potentially reshape the methods and techniques used by urban planners, architects and policymakers.

The concepts of fragility and antifragility have already been explored to some extent in the field of urban and territorial studies, as evidenced by research conducted by Blečić and Cecchini (2020), Chiffi and Curci (2020), Chiffi and Moroni (2021) and Shearer et al. (2021). Additionally, a handful of papers have attempted to apply the idea of antifragility in some specific geographical contexts, such as those authored by Hespanhol (2017), Roggema (2019), Sartorio et al. (2021) and Pasqui (2022). To fully understand the potential of these concepts in the context of contemporary cities and territories, we believe that a more integrative approach is required, one that combines theo-

retical foundations with a transdisciplinary perspective on urban regeneration and transformation.

The book is structured into three parts, each containing several chapters.

PART I

The first part of this book is primarily focused on exploring the theoretical aspects of fragility and antifragility. In Chapter 1, we introduce these concepts and highlight the differences between fragility and risk, as well as the distinction between antifragility and resilience. The main objective of the chapter is to establish that antifragility should not be considered as merely an 'extended' form of resilience.

Moving on to Chapter 2, Simona Chiodo delves into the classical notion of wisdom, and its potential role in dealing with uncertain decisions. She argues that wisdom may play a crucial role in antifragility, as it can effectively navigate the realm of uncertainty beyond the scope of logos.

In Chapter 3, Gabriele Pasqui critically examines the political dimension of 'territorial fragilities', which are closely linked to the increasing socio-spatial inequalities and disparities both between and within regions and urban areas. In the concluding section of the chapter, Pasqui makes a case for repoliticising the concepts of fragility and antifragility.

PART II

The second part of the book provides an overview of the various interpretations of fragility and antifragility from different disciplinary perspectives and paradigms. Chapter 4, authored by Alessandro Balducci, offers an overview of invisible, unseen, or barely visible phenomena to highlight their fragility-exacerbating effects. The chapter aims to demonstrate the relationship between fragility and redistributive policies and identify potential ways to repoliticise the issue of fragility.

In Chapter 5, Ivan Blečić and Arnaldo Cecchini provide a set of operational principles and recommendations for the design and management of urban policies and projects, bridging the gap between theory and practice. They discuss the example of the so-called '15-minutes city' to illustrate how the principles of antifragile design provide insights and tools for its critical examination.

Chapter 6, written by Stefano Moroni, defines 'institutional fragility' and 'institutional malleability' and investigates how institutions react to hard shocks. The chapter shows that while institutional fragility is always undesirable, institutional malleability is not always beneficial.

Chapter 7, by Antonio Longo and Annalisa Metta, based on the theoretical and practical tradition of landscape design, postulates that fragility is

a condition of any territory and an opportunity to give quality, meaning and energy to the places we inhabit. In Chapter 8, Stefano Guidarini examines how architecture can bring to the fore some lesser-known properties associated with the concept of antifragility through durability, flexibility, form, construction, utility and beauty.

PART III

The third part of the book is dedicated to exploring more specific cases and applications of the concepts of fragility and antifragility. Chapter 9, written by Annunziata Maria Oteri, examines some potential antifragile approaches in order to preserve architectural heritage in remote areas suffering from depopulation and abandonment. The chapter argues that architectural preservation cannot be separated from cultural processes, and aims to determine whether certain sociological and anthropological approaches can be utilised to protect abandoned architectural heritage.

Chapter 10, by Antonio De Rossi and Arturo Lanzani, delves into the topic of how the fragility of cities and regions can often be attributed to the development of transport, water and energy infrastructure. The authors explore how the construction of large-scale infrastructure is causing the dissolution of spatially fixed social capital, and thus contributing to the fragilisation of the Italian territories. In the concluding section, they propose potential strategies and actions that could be undertaken in order to counteract the recent trend of expansionary infrastructure initiatives.

Chapter 11, by Massimo Bricocoli and Stefania Sabatinelli, considers social and institutional fragilisation in relation to welfare policies. The authors suggest that 'continuity' is a crucial aspect of welfare support, allowing for the development of practices and actions that promote antifragility in individuals, organisations, territories and policies.

Chapter 12, authored by Davide Ponzini et al., focuses on the case of Matera as the European Capital of Culture in 2019. The authors analyse the interplay between urban heritage and mega-event policies through the lens of a fragility/antifragility framework. Despite enhancing accessibility, public spaces and the local cultural economy, this initiative did not have a significant and direct impact on reducing the city's heritage fragility.

Finally, Chapter 13, by Amalia Zepou and Manos Matsaganis, examines a little-known example of a locally developed system of equitable and sustainable access to scarce water resources on Sifnos Island, Greece. The authors describe the system's function and evaluate its performance using Ostrom's design principles of long-surviving and self-organised resource regimes.

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PART I

Concepts and interpretations of fragility and antifragility

1. Disentangling antifragility from resilience[1]

Daniele Chiffi and Francesco Curci

1.1 INTRODUCTION

Architecture, urban policies and planning are based on the need to prefigure and encourage possible changes that contribute to the construction of 'desirable futures' (the world as we would like it to be); let us call this 'the wishful stance'. This objective can be achieved, on the one hand, thanks to the analysis of past and present phenomena and situations (the world as it was and as it is); let us call this 'the descriptive stance'. Or, on the other hand, thanks to the ability to deal with different and constantly changing possible future scenarios (the world as it will be or could become); let us call this 'the future stance', trying to modify them in accordance with specific values and goals. Simply 'knowing the world as it is' is not enough, of course, to infer 'the world as we would like it to be'. Still, beyond these limitations, what we can do to reduce the gap between the descriptive stance and the wishful stance is to focus on the 'future stance' and the possibility of adhering to it. We think that architecture and urban studies can greatly contribute to shaping the future of our cities and regions. Specifically, urban and regional planning is mainly directed towards some desirable future scenarios envisaged in accordance with specific goals, values and methods, and characterised by different forms of uncertainties. Even if uncertainty may be considered something particularly undesirable,

[1] This work is supported by: (1) the Excellence Project 'Fragilità Territoriali' (2018–2022; L. 232/2016) of the Department of Architecture and Urban Studies (DAStU; Politecnico di Milano); (2) RIBA project 'Norms, Uncertainty and Space (Nous): Cities in The Age of Hyper-Complexity' (DAStU; Politecnico di Milano); (3) RETURN Extended Partnership, Multi-risk science for resilient communities under a changing climate, European Union Next-GenerationEU (National Recovery and Resilience Plan – NRRP, Mission 4, Component 2, Investment 1.3 – D.D. 1243 2/8/2022, PE0000005); (4) Italian Ministry of University and Research under the PRIN Scheme (Project no. 2020SSKZ7R). We thank Stefano Moroni and Luca Zanetti for their remarks on a previous version of this chapter.

it is important to clarify that without uncertainty there would be no need to innovate and plan, in the sense that uncertainty is one of the main triggers of progress and one of our doors to the future (Chiffi et al. 2022; Moroni and Chiffi 2021).

In addition to the pivotal issue of uncertainty, many key related notions are connected in urban and regional studies with the possibility of planning desirable futures, namely risk, fragility, vulnerability, resilience and antifragility.[2] In this chapter, we assume fragility as a hallmark of contemporary urban and regional systems, which should not be collapsed into the notion of vulnerability in risk analysis. Likewise, we critically discuss the dangers of collapsing the recently introduced notion of antifragility into any type of resilience. We hold the view that a conceptual clarification of all these terms may have a deep impact at both the methodological and policy levels when dealing with new sociospatial challenges and inequalities. Section 1.2 explores the relations between the concepts of risk and uncertainty, while section 1.3 critically discusses the notion of fragility.[3] Section 1.4 focuses on the conceptual and methodological differences between different forms of resilience and antifragility and their implications for urban and regional studies. Finally, section 1.5 concludes the chapter.

1.2 RISK AND UNCERTAINTY

Given its nature, the adoption of the concept of fragility in urban and regional studies can hardly be explained without referring to the main elements of risk analysis and studies on uncertainty. For this reason, we focus first on the main elements of risk and then on recent research on types of uncertainty in decision-making to provide a suitable framework within which to interpret fragility.

1.2.1 Understanding Risk

The first notion that we consider is the concept of risk. When referring to risk, many different definitions are implied, some informal and some more technical. Moreover, the concept of risk may have different meanings and conceptualisations among different disciplines and even within the same field.

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[2] Although the concept of antifragility was introduced by Taleb (2012), our use of this concept and allied notions is not an analysis or interpretation of Taleb's views.

[3] The reflections presented in sections 1.2 and 1.3 were developed for the first time in our previous publications, Chiffi and Curci (2022) and Chiffi and Curci (2020), respectively.

In probabilistic risk assessment, a classic (and technical) definition is the one given by the Royal Society, according to which risk is a function of the probability of an event, the magnitude of its effect and the severity of the consequences in a stated period (Royal Society 1983). This is a probabilistic and consequentialist definition of risk, since its two main ingredients are the probability of the unwanted event and the severity of its consequences. Therefore, risks with high probability and small consequences are equivalent to risks with low probability and severe consequences. However, other definitions can also be found in the literature. For instance, risk can be understood as: (1) an unexpected event that may or may not occur; (2) the cause of an unexpected event that may or may not occur; (3) the probability of an unexpected event that may or may not occur; (4) the expected statistical value (that is, the product of the probability and a severity measure) of an event that may or may not occur – this is essentially the definition given by the Royal Society; and (5) the fact that a decision was made under known conditions of probability (known unknowns); see Hansson (2022a; Roeser et al. 2012).

Definition (1) only stresses the unexpected nature of a risky event, while (2) identifies the cause of an event with the risk itself. Of course, it is one thing to talk about risk factors, but quite another to be able to distinguish between risk and cause, which can often become extremely misleading. Definition (3) highlights the random character of a risky event, regardless of the potential impact of the consequences of such an event. Quite contrarily, (4) includes, in the definition of risk, the assessment of possible consequences. The last definition, (5), stresses how decisions taken under risk conditions fall within the scope of known unknowns; that is, of those events that may or may not occur, and of whose potential occurrence we have at least a probabilistic assessment.

In the field of disaster risk assessment, in particular, the following are identified as risk components: the potential danger (or hazard), the exposed value (or exposure), and the vulnerability, which can be defined as the susceptibility of the exposed elements (people, manufactured products, economic activities, and so on) to suffer damage caused by a specific potentially harmful event (UNISDR 2015; Balducci et al. 2020). Understanding the sources of risk by means of its three components is particularly relevant for policy-based considerations of risk mitigation, since an understanding of the specific nature of the risk can help the experts to mitigate the hazard or the exposure, and possibly also reduce the vulnerability.What many of the different definitions of risk have in common is an evaluative and normative component that contributes to the multidimensionality of the concept.

1.2.2 Reflections on Uncertainty

The second notion that we consider is uncertainty. As we have seen, we can technically speak of (probabilistic) risk when we are able to both estimate the expected value of a possible event from a probabilistic point of view – since elements such as its statistical distribution are known – and to evaluate its possible consequences in a stated period. A well-known example of a decision taken under conditions of risk is that of betting on roulette at a casino: here, all the probabilities of an event are computable *ex ante*. When this is not possible, we speak generically of uncertainty, which in the most severe forms is called severe uncertainty (unknown unknowns) or even ignorance (Carrara et al. 2021). Severe uncertainty (also known as fundamental, genuine, deep or great uncertainty) has a nonprobabilistic nature and represents the most common form of uncertainty that we experience in everyday life. Keynes makes this concept clear by stating that:

> By 'uncertain' knowledge I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty ... The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence ... About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know. (Keynes 1973: 213–214)

According to Keynes's perspective, it can be difficult to give a probabilistic risk assessment of deeply uncertain events that we have (almost) never even considered. It is exactly in these cases that we speak of uncertainty. In the following section, we clarify the reasons that we believe fragility adheres more to notions related to forms of uncertainty than to risk.

Together with the related concepts of risk and ambiguity, uncertainty has long been a key concept in psychology, economics, decision-making and planning processes (Lipshitz and Strauss 1997). In particular, urban problems are usually shaped by different forms of uncertainty and complexity and are the prototypical example of so-called wicked problems (Rittel and Webber 1973), which are often dealt with in planning theories. The term 'wicked' points to complex and 'malicious' dilemmas that can only be fully expressed and understood after the formulation of their solution; in turn, a solution will be difficult to formulate due to the problem's uniqueness and the poorly defined aspects involved. In other words, to anticipate any questions arising from wicked problems, it is necessary to have knowledge of all possible solutions. Urban problems – with their multifaceted structures and ways of interacting with other complex and scarcely defined systems – seem to belong even more to this family of problems. Given their complexity, we hold the view that to properly cope with them, it is important to disentangle the different types

of uncertainty that shape a wicked problem. In this way, the planner may understand the nature of the uncertainty involved in the problem and suggest potential strategies to cope with it.

1.2.3 Types of Uncertainty

Uncertainty comes in different forms, and a few studies have proposed specific taxonomies based on the various factors that contribute to its formation, management and treatment, especially with respect to decision-making and planning processes. We discuss some interesting classifications and conceptualisations that may help us to understand the specific features of uncertainty present when making decisions about cities and regions. An initial taxonomy is based on the analysis of hundreds of decision-making self-reports and differentiates three main causes of uncertainty: inadequate understanding, incomplete information and undifferentiated alternatives (Lipshitz and Strauss 1997). Inadequate understanding may depend on equivocal information due to novel, fast-changing or unstable situations. Incomplete information may depend on a partial or complete lack of information or unreliable information. The third cause of uncertainty (undifferentiated alternatives) refers to the fact that, even when information is perfect, decision-making can be affected by the conflict among alternatives owing to equally attractive outcomes or to incompatible role demands.

A second taxonomy is founded on the nature and object of uncertainty (Bradley and Drechsler 2013). According to Bradley and Drechsler, the nature dimension relates to the kind of judgement being made. In this case, it is possible to distinguish three forms of uncertainty: modal uncertainty about what is possible or what could be the case, empirical uncertainty about what is the case (or has been or would be the case), and normative uncertainty about what is desirable or what should be the case. The object dimension relates to the features of reality towards which agents' judgements are directed. Here, it is possible to distinguish two forms of uncertainty: factual uncertainty about the way things are now, and counterfactual uncertainty about the way things could or would be if things were other than the way they are.

Furthermore, in attending to dynamically adaptive systems, some authors have proposed taxonomies based on the sources of uncertainty across the three distinct levels of the management and decision-making process: the requirements level, the design level and the run-time level (Ramirez et al. 2012). Uncertainty at the first level is owed to the idealisation, misunderstanding and incompleteness of functional and nonfunctional requirements (e.g., missing or ambiguous requirements, falsifiable assumptions). The second level is uncertain, primarily due to unexplored alternatives and untraceable design.

Uncertainty in the third phase occurs primarily because of environmental unpredictability.

A comprehensive and transversal taxonomy that partially embraces previous proposals has been outlined recently by Hansson (2022b), and for a critical discussion in the context of post-pandemic cities, see Chiffi and Curci (2022). According to this taxonomy, we can list the following types of uncertainty:

1. Factual uncertainty. This uncertainty surrounds the facts of the physical world and may usually be quantified and formalised.[4]
2. Possibilistic uncertainty. This form of uncertainty concerns what can possibly be known. In this case, uncertainty depends on many factors, such as: (a) the constraints on the information that an agent may obtain in a specific context at a given time; and (b) the very nature of the decision, which may deal with forms of logical, physical, biological and social possibility.
3. Metadoxastic uncertainty (or uncertainty of reliance). Our beliefs may be uncertain. This uncertainty is a second-level judgement about the accuracy of one's beliefs and is expressed, for instance, by second-order probabilities or confidence intervals.
4. Agential uncertainty. This type of uncertainty considers individual future decisions and actions. It cannot be formalised or quantified, as there is no suitable decision method. For instance, there is no proper methodology to formalise or compute the consequences of whether one will get married in two years. This uncertainty is thus related to the decisions and behaviours of individuals.
5. Interactive uncertainty. Uncertainty may be the result of interactions between individuals or between individuals and institutions or companies. This form of uncertainty can usually be formalised by means of (epistemic) game theory, even if it cannot be quantified.
6. Value uncertainty. Philosophers and economists have recently begun discussing the normative component of uncertainty, which goes beyond its factual forms. They have thus introduced the notions of moral uncertainty and normative uncertainty (Lockhart 2000; MacAskill et al. 2020). The latter is a much broader concept than the former. Moral uncertainty is intended as uncertainty about what we morally ought to do (MacAskill et al. 2020: 2). Normative uncertainty involves norms in the legal sense, but it 'also applies to uncertainty about which theory of rational choice is correct and uncertainty about which theory of epistemology is correct'

[4] In the context of modeling, parametric and model uncertainties are usually considered to be epistemic forms of uncertainty, while Hansson (2022b) considers them to be factual forms of uncertainty.

(MacAskill et al. 2020: 2–3). It focuses on the value-based dimensions of conditions of inexactness and unpredictability (Taebi et al. 2020). Thus, normative uncertainty involves valuative considerations in those aspects of decision-making related to epistemology, ethics, law and politics.

7. Structural uncertainty. The true structures, limitations and impacts of complex decisions are almost always unknown. This uncertainty may be caused by a number of factors: (a) the delimitation of the issue covered by the decision may not be fixed or known; (b) the scope of the decision may be unclear; (c) it may be unclear who is going to make the decision; (d) the timing of the decision may be uncertain; and (e) the consequences of the decision may be difficult to conceive and evaluate.
8. Linguistic uncertainty (ambiguity). This uncertainty is due to linguistic ambiguity and is mainly related to the semantics of the terms involved in decision-making.

1.2.4 Types of Uncertainty and Climate Change in Cities and Regions

In this subsection, we provide specific examples connecting contemporary cities and regions with different uncertainties. In doing so, we focus on one of the major themes with which the notion of uncertainty is often associated in these contexts. Our intention is to show how all the different types of uncertainty listed above take shape around the general phenomenon of climate change and their implications for cities and regions.

Climate change is a fact based on scientific evidence reported in more than 14 000 scientific publications (Masson-Delmotte et al. 2021). Nevertheless, according to some scholars, uncertainty remains intrinsic to climate change, not per se, but due to: (1) the magnitude of the various inputs that contribute to the climate regime (Heal and Kristrom 2002); and (2) its several implications, mainly socioeconomic (Heal and Millner 2014).

Especially 'in the early days of climate science, uncertainty was often seen as challenging the authority of science itself, causing uneasiness among scientists' (Mehta et al. 2019: 1529). It was at the beginning of the twenty-first century that the Intergovernmental Panel on Climate Change (IPCC) recognised five stages of uncertainty: (1) emission scenarios; (2) responses of the carbon cycle to emissions; (3) sensitivity of the climate to changes in the carbon cycle; (4) regional implications of a global climate scenario; and (5) possible impacts on human societies (Heal and Kristrom 2002). According to Heal and Kristrom (2002), these five stages of uncertainty can be aggregated into three main types of uncertainty: scientific uncertainty, impact uncertainty and policy uncertainty. From an alternative perspective, according to the PRIMAVERA project funded by the European Commission in 2020 (PRIMAVERA 2020), in climate sciences we can distinguish three types of uncertainty: natural variabil-

ity, scenario uncertainty and model uncertainty. This is a partial classification limited to climate projections, but it is useful to recall it along with the other different classifications to place all of them in relation to the types of uncertainty theorised by Hansson (2022b). For instance, according to Hansson's texonomy, natural variability and model uncertainty are special forms of factual uncertainty, and this is not very common because model uncertainty is usually considered something epistemic, whereas scenario uncertainty seems to be mainly related to possibilistic uncertainty. However, it is important to distinguish: (1) uncertainty about which model best represents the phenomenon or which model is more reliable, which leads to empirical uncertainty; and (2) uncertainty about which model is more compatible with the evidence, especially if you have scarce data at your disposal. This type of uncertainty would count as metadoxical uncertainty. Let us now reconsider Hansson's taxonomy with reference to the uncertainties related to climate change:

1. Factual uncertainty is mainly related to natural variability and objective facts. It is linked to what has been happening in cities and regions due to climate change, including all the aspects related to the availability of data and statistics, with an emphasis on differences between countries, regions and cities. In this case, from an empirical and analytical point of view, science plays a decisive role. A possible example of the factual type of uncertainty is the sea-level rise phenomenon, which is affected by model uncertainty.[5] This phenomenon may impact differently on coastal cities and settlements due to local specificities that cannot be completely and equally known, such as coastal geomorphology, sea bathymetry, and urban morphology. Regardless of model uncertainty, factual uncertainty is closely linked to the impossibility of knowing every geographical situation with the same detail and quality of information.
2. Possibilistic uncertainty is mainly based on scientific and technological reasons and is connected to everything we might discover but is still unknown. Disruptive technologies may improve, for example, the way to mitigate anthropogenic emissions of greenhouse gases as well as the way infrastructures and built environments can adapt to global warming and unprecedented climate events. In this case, science especially plays a decisive role, not just from the empirical-analytical point of view but also from the point of view of its twofold innovative potential, that is: (a) to improve and extend the existing knowledge; and (b) to propel technology in new directions (Park et al. 2023).

[5] It is worth noting that the future scenarios assessed by the IPCC have different levels of confidence according to the so-called Representative Concentration Pathways (RCPs).

3. Metadoxastic uncertainty involves, for instance, the cogency and reliability of data and projections regarding global warming. Such uncertainty is caused by doubt about whether the model used in an assessment process is correct (Gardoni and Murphy 2014). The effect of this form of uncertainty strongly affects urban planning and policies, since urban planners and policymakers rely on a chosen set of quantitative assumptions and statistical projections among those provided by different subjects and with different levels of confidence and accuracy. To reduce the metadoxastic uncertainty in the field of climate change studies, intermodel and interscenario comparisons have been developed in the form of model intercomparison projects (MIPs) aimed at implementing a common study protocol (Tavoni et al. 2015; Wang and Teng 2022).
4. Agential uncertainty mostly relates to the personal and to implications of global warming and is connected to how likely it is, for example, that individuals will consider cities less habitable or safe than other geographic and settlement contexts, while also anticipating new types of housing, jobs and transportation forms. In this case, the attention is placed on purely individual choices that are independent of both endodoxastic and metadoxastic uncertainties (see Hansson 2006).
5. Interactive uncertainty is another form of uncertainty sensitive to social and political implications. It influences negatively or positively the way, for instance, in which building, industrial and transport constraints will be accepted, transgressed or possibly subjected to forms of social imitation. This type of uncertainty also encompasses the risks of organised forms of protest by groups of people against decision-makers, political leaders and public institutions, as well as the formation and contribution of new international climate alliances and movements, or new green local communities.
6. Value uncertainty is mainly linked to the principles placed at the basis of ethical and political theories, national and international political agendas, and constitutional frameworks. By way of example, we may ask whether and to what extent climate change will guide urban agendas and policies, or whether other events, such as pandemics and a new war, will contribute to shifting them towards new, not converging objectives (Taebi et al. 2020).
7. Structural uncertainty. A crucial component of uncertainty related to climate change also pertains to the role of national and international bodies and networks involved in the forecasting, monitoring and policy implementation processes. Particularly, structural uncertainty is related to questions about where the governance of climate change should take place and who should conduct and be responsible for the governance of climate change (Bulkeley and Newell 2023: 11). While the main objective of the

decisions to be taken seems to be almost clear (the reduction of greenhouse gas emissions), the spatial and temporal delimitation of the scope is not completely fixed, and the decision responsibility is consequently fragmented and unclear. In recent years, many governments have wondered about which governance structure is suitable for implementing climate transition and climate neutrality. New national climate laws, for example, have been adopted in the European Union to provide a legal framework for decarbonisation and greenhouse gas reduction (CAN Europe 2022). These kinds of initiatives confirm the importance of 'structural factors in shaping the international climate negotiations and policy outcomes' (Bulkeley and Newell 2023: 11).

8. Linguistic uncertainty. This kind of uncertainty has to do with ambiguity. It is therefore necessary to remember here how much, even only at the media level, the perception of climate change can derive from purely linguistic choices and constructs. Let us think, for example, of terminologies that emphasise the exceptionality, unpredictability or anomaly of some climatic events that are instead the manifestation of a phenomenon that is anything but exceptional, unpredictable or anomalous, such as climate change. This is the case of 'anomalous waves', 'water bombs' and 'anomalous heat waves'.

Even though the interplay between different types of uncertainty has a clear impact on decision-making and planning strategies, it is common for uncertainty to be treated as a singular phenomenon. However, our analysis shows that uncertainty has a multifaceted nature, which means that it is possible to identify and evaluate specific types of uncertainty. By doing so, we can create a more comprehensive and informed interpretative framework for complex sociospatial phenomena.

1.3 FRAGILITY

By 'fragility' we refer in a broad sense to the quality of an object or system (but metaphorically also of a person, a social group, a territory, and so on) to be easily 'broken' (from the Latin *frangĕre* which means 'to break') even by a minor, ordinary or nonviolent force (Chiffi and Curci 2020). 'Fragile' describes an object or system – metaphorically also a person or a social group – that for intrinsic reasons can be damaged or can suddenly break even in the face of ordinary and nonviolent stresses. Fragility may in fact increase or decrease over time, and can even appear in the absence of disruptive events or interventions due to the gradual effect of passing time, or to mere exposure to environmental agents. Strictly speaking, however, fragility is an intrinsic characteristic associated with a specific fracture modality (whether short, sudden

or abrupt) that is independent from specific hazards. Exogenous stresses and shocks can increase fragility since they produce structural changes in the affected object or system, but in any case, it is not possible to speak of 'fragility to something'. Of course, it is possible to recognise new states of fragility that are the result of previous external solicitations, but fragility is not defined by what lies outside of the object, nor is it a variable depending on future hazard scenarios. From a system-oriented perspective, fragility is mainly related to a loss in functions (almost always irreversible) of the system, and when the system is 'broken' it cannot easily return to its original functionality (Ansar et al. 2017).

The concept of fragility involves some of the aforementioned types of uncertainty that result from the complexity of the object or system to which it refers. In particular, being connected with severe uncertainty, fragility is particularly sensitive to those types of uncertainty that cannot be quantified: agential, interactive and structural uncertainty. This is why one must consider the possibility of unexpected scenarios coming to the fore, which is evident not just in the case of simple objects, but even more in complex systems such as cities, territories or ecosystems. On the contrary, the notion of vulnerability is linked to a specific hazard in a clear and well-defined scenario. Indeed, being vulnerable means being vulnerable to something. When referring specifically to complex systems rather than to single objects, fragility cannot be linked deterministically to specific hazards, nor does it lend itself to probabilistic calculations. It expresses a condition of severe uncertainty related to various, and not necessarily known, factors that could cause damage and breakage.

Outside the field of material physics, the concept of fragility has been a concept with low scientific usability, although it is highly expressive and suggestive in terms of the communication of some contemporary (social and medical) facts and phenomena. Nevertheless, other scientific fields have recently begun using it as a new conceptual tool. Interestingly enough, something fragile is not necessarily vulnerable if it is protected from certain external events, or if agents are able to potentially trigger or accelerate its breaking process. In fact, when we talk about the vulnerability of an object or system, we refer to the condition of insufficiency or inadequacy of its protective means with respect to a specific potential danger. Vulnerability therefore involves those characteristics that influence the ability to anticipate, cope with and oppose a hazardous event (Wiesner 2016; Eriksson and Juhl 2012). Vulnerability regards a condition prior to a specific shock; thus, it can also refer to individuals and objects as well as to communities, systems, organisations and territories.

Averting fragility, therefore, may lead us down different paths, some of which deal with the issue of predisposition. Strictly speaking, predisposition precedes a shock without directly affecting the adaptability of a system in the

subsequent phase. From a philosophical standpoint, such a predisposition (to break) can be read as a disposition (Borghini and Williams 2008). Dispositions in fact represent the ability of an object or system to trigger a certain situation (that is, its manifestation) as the result of a set of stimuli that are, in turn, linked to the dispositions of other objects involved in the shock; such other objects also have their own dispositions, and it is thanks to the complementary dispositions of the involved objects that mutual manifestations are produced. For example, a glass bottle – a fragile material *par excellence* – can be destroyed by the blow (that is, an appropriate stimulus that causes shock) of a hammer (an object with a disposition to breaking fragile objects). Dispositions are characterised by the manifestations they produce, and are thus specific to certain manifestations. As previously mentioned, the disposition to fragility has its manifestation in an abrupt and rapid rupture, and this is the reason why fragility can be seen as the disposition of an object or a system to break abruptly. However, for a disposition to possess any possible behaviour, it is not necessary for its manifestation to occur: a fragile object in fact expresses in itself the possibility and, above all, the typology of its own breaking. This also implies that a family of different stimuli can lead to the same type of shock. In the case of the glass bottle, we know that it can break in various ways, meaning that the manifestations of its disposition to being fragile are multiple and diverse: the bottle can break into two or three parts, but also shatter, crumble, and so on. Common dispositions (such as the disposition to fragility) for which there is a plurality of manifestations and appropriate stimuli (that is, proper to create shock) are called conventional dispositions. Canonical dispositions, on the other hand, are characterised by an explicit and specific set of stimulus conditions and manifestations (Choi 2008).

An example of canonical disposition is the disposition to vulnerability. Vulnerability is usually expressed with statements such as '6 per cent of buildings in this city would collapse following a storm with the wind at 160 km/h and an inclination of 44 degrees'.[6] In this case, both the stimulus condition (wind speed and inclination) and the manifestation (the collapse of 6 per cent of buildings) are well specified. It is worth noting that vulnerability can be linked to the (probabilistic) notion of the risk of a specific shock, following a precise and unambiguous description of the appropriate stimulus for determining it; fragility, instead, involves deeper forms of severe uncertainty.[7] In fact, fragility is difficult to express by means of probabilistic measures, since

[6] Measures of vulnerability can be expressed by means of probabilities, imprecise probabilities or in a qualitative way.

[7] However, nothing prevents (probabilistic) measures from being applied to the intensity of the stimulus in a fragility-related process.

the appropriate stimulus conditions and manifestations are not always or completely (or cannot be) explicit. As we have seen, the existence of several stimuli and different possible manifestations of the shock also depends on the dispositions of the other objects able to cause the 'rupture'.

Contrary to what happens with vulnerability, the events inducing the shock do not need to be specified from time to time. The concept of fragility, in fact, involves forms of uncertainty that result from the complexity of the object or system to which it refers. This is why one must consider the possibility of unexpected scenarios coming to the fore, which is evident not just in the case of simple objects, but even more in complex systems such as cities, territories and ecosystems. In contrast, the notion of vulnerability is linked to assessing the severity of the consequences of a specific hazard in a clear and well-defined scenario.

All in all, notions such as probability, expected utility, damage and consequence assessment can be highly problematic when applied to the concept of fragility. This does not mean that probabilistic risk estimates are always useless for the analysis of fragility; yet they are clearly not the only tool available, nor do they represent the most appropriate method to follow.

1.4 ANTIFRAGILITY AND RESILIENCE

In the previous section, we outlined the connection between the notion of fragility and the notion of uncertainty. Still, fragility and risk share some properties, that is, they are not neutral terms, for they both refer to potentially negative outcomes. The notion of uncertainty, however, is used in a more neutral way (that is, from an uncertain situation may follow both positive and negative things).

Nassim Taleb (2012) introduced the concept of antifragility, which is mainly associated with the possibility of gaining positive outcomes after a shock in an uncertain context. More specifically, he pointed out that not all uncertainties can be prevented, and the idea behind antifragility is not only to survive trauma or to simply improve the performance of a given system in response to a shock, but to reinvent and evolve the system as a whole. The basic idea of the concept of antifragility is that of evaluating uncertainties at the stress level in relation to possible positive outcomes related to the future performance of a system. In this way, it is possible to integrate risk analysis, which mainly focuses on negative outcomes with an antifragile perspective that is sensitive to the positive outcomes deriving from a shock in a system. A clear explication of the concept of antifragility is owed to Terje Aven. He clarified that, unlike any form of resilience, the key contribution of the concept of antifragility is related to the possibility of coping with the future stages of a system in which new functions can emerge. If the system is not resilient, it is not able to sustain its functions

in the presence of a specific stress. Resilience deals with the stress dimension but does not see this in relation to future developments of the system that extend beyond established functions (Aven 2015; Proag 2014). The main idea is that resilience is the ability of a system to absorb disturbance and reorganise while undergoing change, in order to retain its fundamental function, structure, identity and feedbacks (Walker et al. 2004).

Resilience, however, can be intended in at least two senses. According to a restricted view, resilience has the purpose of restoring the functions and the outputs of a system to a condition before the shock (the so-called bouncing-back), while according to an extended view of resilience, the previously existing functions are restored, and the system can even produce better outcomes with respect to the pre-shock condition (the so-called bouncing-forward). In recent years, we have seen how much the concept of antifragility struggles to be disentangled from resilience.[8] Antifragility has been in fact considered by some literature as 'extended resilience' (Blečić and Cecchini 2020), which is sometimes also termed (with some small conceptual variations) 'hard resilience' (Proag 2014), 'transformative resilience' (Dahlberg 2015), 'aggressive resilience' (Carey 2020) and 'global resilience' (Thorén 2014), among others.[9] According to Blečić and Cecchini's interpretation, antifragility would be more specifically a limit case of 'extended resilience', which goes beyond the perspective of a mere return to the state prior to the shock. However, it is worth noting that extended resilience occurs without any fundamental change in the structure and function of the system. Only antifragility has the possibility to deal with the emerging functions of a system after a shock to gain positive outcomes, also by virtue of these new functions, and these new functions may be due to structural redundancies of the system. The assessment and evaluation of possible emerging functions in a system after a shock are crucial elements in differentiating antifragility from extended resilience. In this way, a system may become as adaptive, responsive and flexible as possible in the future (Derbyshire and Wright 2014). As suggested

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[8] It seems that this extended form of resilience was not considered by Taleb. He pointed out that 'the ... resilient is neither harmed nor helped by volatility and disorder, while the antifragile benefits from them' (Taleb 2012: 17). Still, we think that antifragility can be differentiated by extended resilience.

[9] Resilience was introduced as a descriptive ecological term by Holling (1973). He also proposed a classical distinction of two types of resilience. He distinguished between 'engineering resilience' and 'ecological resilience', observing that 'the first definition, and the more traditional, concentrates on stability near an equilibrium steady state, where resistance to disturbance and speed of return to the equilibrium are used to measure the property', while 'the second definition emphasizes conditions far from any equilibrium steady state, where instabilities can flip a system into another regime of behavior – that is, to another stability domain' (Holling 1996: 33).

by Aven (2015: 482), 'the antifragility concept emphasizes the importance of not being satisfied with performance compliance at specific points in time. What is coming next needs always to be highlighted'. And notably, in a system that is extensively resilient, future exposure to uncertainty should still be minimised, while an antifragile system would seek to increase future exposure to uncertainty (Munoz et al. 2022). Antifragile systems may require stressors to stimulate positive adaptation. This means that in the case of new exposure to uncertainty, the antifragile system, by virtue of its capacity to promote new functions, can keep gaining from uncertainty, while a resilience system cannot introduce new functions and benefit from exposure to new uncertainty. Finally, resilience may be more localised. A specific part or component of a system can be resilient, while antifragility always refers to the whole system.

These are the reasons to avoid the collapse of antifragility into resilience. Therefore, the distinction between these two concepts is clear from the dynamic perspective of systems facing recurrent disturbances and disruptions: if one focuses on a single shock, it is more likely that people confuse resilience and antifragility.

1.5 CONCLUSION

Concepts such as risk, uncertainty, fragility, vulnerability and resilience suffer from severe semantic variability, which may deeply impact upon the ways in which we conceptualise, organise and regulate ecological and social systems. This is particularly true in the context of urban and regional research, in which space and society interact in extremely complex systems. In this chapter, we have critically discussed those probabilistic risks that can be measured, and forms of (severe) uncertainty that can resist any form of quantification or even formalisation. More specifically, we have discussed different types of uncertainty related to climate change, since this phenomenon is a challenge for all contemporary cities and regions and involves a great variety of uncertainties.

The notion of risk is a normative and evaluative notion with a negative connotation, while the notion of uncertainty is a much more neutral concept with possible negative or positive consequences. Given this twofold characterisation of uncertainty, we have analysed the concept of fragility, which is related to the negative consequences of uncertainty related to a stress of the system, and the opposite notion of antifragility, related to the positive consequence subsequent to the stress. Both notions, of fragility and antifragility, consider the functionality of the system to be a key factor. In the context of a fragile system, some functions are (even irreversibly) lost and cannot be restored, while in the context of antifragile systems, new functions may emerge after stressing the system. We have explored the distinction between fragility as one concept related to the constellation of concepts connected to uncertainty

and the notion of vulnerability, which is much more sensitive to issues in risk analysis. Furthermore, two senses of resilience have been isolated: a restricted sense of resilience in which a system is capable of restoring its original functions after a shock, and an extended sense of resilience in which the original functions of the system are restored and their effects have overall improved the system compared to the pre-shock situation. Extended resilience has been collapsed by some authors into the notion of antifragility by virtue of its apparent similarities. However, only antifragility can increase the functions of a system after a shock.

The main reason for applying the concepts of fragility and antifragility to urban and regional problems is to be found in the necessity of dealing with different types of uncertainty related to wicked problems. However, another reason is the unsustainable increase in inequalities between people, social groups and territories. Social inequalities do not only always assume a spatial dimension, but are one of the main causes of the fragility of contemporary territories. In light of this, when considering the forms of fragilities that affect territories, we can recognise a transition between two different paradigms. In fact, in recent decades, the focus on sociospatial gaps appears to have moved away from the developmental paradigm that interpreted gaps as a 'lag in development'. The focus seems now to have shifted towards the 'distributive and environmental justice' that is present even in the most developed and economically advanced territories; which should, on the one hand, promote a fair distribution of risks and resources, and on the other hand, promote individual and collective action in the face of the uncertainty of the future. To promote the possibility of shaping the world as we desire it to be, it is indeed necessary to consider the connections between uncertainty and inequalities within cities and regions. This is a promising area for future research; indeed, it is tackled in subsequent chapters of this book.

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2. Forms of rationality facing uncertainty: wisdom's possible key role in antifragility

Simona Chiodo

2.1 INTRODUCTION

When Taleb defines the notion of antifragility, on the one hand he brings into play the typical characteristics of our era, especially when it comes to global challenges, from climate change to pandemics ('shocks … volatility, randomness, disorder, and stressors and … adventure, risk, and uncertainty', Taleb 2012a: 3), and on the other hand he considers them as opportunities: antifragility is precisely what can 'benefit from shocks' (Taleb 2012a: 3), in that it 'is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better' (Taleb 2012a: 3). As a philosopher, I cannot help but notice that the notion of antifragility shares something essential with a precise philosophical notion: the notion of wisdom as the form of rationality that, from ancient Western culture to contemporary Western culture, means, among other things, the capacity to make a virtue of necessity, that is, to 'benefit from shocks', especially when it comes to facing the unknown, that is, 'uncertainty'.

In what follows, I first briefly define the notion of wisdom by referring to the history of philosophy (section 2.2), then propose a further development of the notion of wisdom (section 2.3). Next, I argue that the notion of wisdom can promisingly work together with the notion of antifragility, specifically by underpinning it, when it comes to facing what may be considered as our era's most dramatic challenge: the need to decide and act even in the most uncertain scenarios (section 2.4). More precisely, I argue that the notion of wisdom can be thought of as a form of rationality that is promisingly complementary to the notion of logic, which alone cannot successfully face the most uncertain scenarios.

Before proceeding, it is worth noting that our era's global challenges imply uncertain scenarios even surpassing climate change and pandemics. To give

one (paradoxical) example, the less fragile our cities seem to become, by being increasingly technological, specifically digital, the more fragile they seem to become, by increasingly being hackable through digital technologies. More precisely, 'The cyber-weapon is the flipside of the near-future city, the id of the smart metropolis' (Manaugh 2021: 76):

> As we transform our cities into interactive textures or linked technologies, digital vulnerabilities become as much a part of the urban fabric as do tunnels, bridges, and towers. The capacity of the built environment to be digitally exploited – to be hacked or malevolently commandeered – will soon be as much a part of design criticism as whether a particular structure is affordable, accessible, or fabricated using sustainable materials. Is this building digitally safe? (Manaugh 2021: 77)

For instance, 'Imagine residents unable to enter (or to leave) certain buildings, life-saving systems such as fire-suppression networks remotely jammed by hacking, or even entire communities blocked from crossing automated roadways' (Manaugh 2021: 76). In what follows, I shall argue that wisdom can promisingly complement logic when it comes to facing challenges that imply uncertain scenarios, from climate change to pandemics to the (paradoxical) fragility of digital cities, and to argue that wisdom can promisingly face challenges implying uncertain scenarios means to argue that wisdom can promisingly work together with antifragility, specifically by underpinning it.

2.2 WHAT WISDOM IS

Ancient Greek philosophy as the cradle of Western culture teaches us that logic is not the only form of rationality we have at our disposal. Even though logic, that is, *logos* (λόγος) as 'computation, reckoning',[1] wins over other forms of rationality from ancient culture to contemporary culture (see e.g. Porter 1995), it is joined especially by another form of rationality: *metis* (μῆτις), as 'wisdom, skill, craft … counsel, plan, undertaking',[2] also integrating *phronesis* (φρόνησις) as 'purpose, intention … practical wisdom, prudence in government and affairs'.[3] More precisely, according to Plato, wisdom

[1] Liddell–Scott–Jones Greek–English Lexicon, https:// artflsrv03 .uchicago .edu/ philologic4/LSJ/query?report=bibliography&method=proxy&head=logos&start=0&end=0 (accessed October 2021).

[2] Liddell–Scott–Jones Greek–English Lexicon, https:// artflsrv03 .uchicago .edu/ philologic4/LSJ/navigate/47/1/1517/ (accessed November 2021).

[3] Liddell–Scott–Jones Greek–English Lexicon, https:// artflsrv03 .uchicago .edu/ philologic4/LSJ/navigate/81/1/315/?byte=418670 (accessed November 2021). More precisely, the semantic area of *phronesis* converges with that of *metis* (in that both refer to a kind of practical thinking) and diverges from the semantic area of *logos* (which

especially means self-awareness of lack of knowledge: 'what I do not know I do not think I know either' (Plato 1966: 21 d), 'For I was conscious that I knew practically nothing' (Plato 1966: 22 d). (For *phronesis*, see Plato 1967: 352 c and Plato 1925: 209 a). Also according to Aristotle, wisdom especially means knowledge, specifically practice-oriented knowledge, as the capacity to distinguish right from wrong when it comes to deciding and acting: 'men like Anaxagoras and Thales … while admitting them to possess a knowledge that is rare, marvellous, difficult and even superhuman, they yet declare this knowledge to be useless, because these sages do not seek to know the things that are good for human beings' (Aristotle 1934: 1141 b). (For *phronesis*, see Aristotle 1934: VI, 5.) Stoic philosophers, starting with Seneca, continue to define wisdom as practice-oriented knowledge, especially in regard to being resilient to practical obstacles:

> as certain cliffs, projecting into the deep, break the force of the sea, and, though lashed for countless ages, show no traces of its wrath, just so the spirit of the wise man is impregnable, and has gathered such a measure of strength as to be no less safe from injury (Sen. Const. III 5)

Moving from ancient philosophy to modern philosophy, wisdom continues to be defined as practice-oriented knowledge. Descartes stresses that practice-oriented knowledge especially means making a virtue of necessity: 'by "wisdom" is meant not only prudence in our everyday affairs but also a perfect knowledge of all things that mankind is capable of knowing, both for the conduct of life and for the preservation of health and the discovery of all manner of skills' (Descartes AT IXB 2); wisdom 'teach[es] us to be masters of our passions and to control them with such skill that the evils which they cause are quite bearable, and even become a source of joy' (Descartes AT XI 488). Finally, moving from modern philosophy to contemporary philosophy, after Fichte's further stress on wisdom as practice-oriented knowledge (see Fichte 1794–95), Nozick gives us the following inspiring definition of wisdom:

> What a wise person needs to know and understand constitutes a varied list: the most important goals and values of life – the ultimate goal, if there is one; what means will reach these goals without too great a cost; what kinds of dangers threaten the achieving of these goals; how to recognize and avoid or minimize these dangers; what different types of human beings are like in their actions and motives (as this presents dangers or opportunities); what is not possible or feasible to achieve (or avoid); how to tell what is appropriate when; knowing when certain goals are sufficiently achieved; what limitations are unavoidable and how to accept them; how

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refers to a kind of theoretical thinking, specifically 'computation, reckoning', as we have seen).

> to improve oneself and one's relationships with others or society; knowing what the true and unapparent value of various things is; when to take a long-term view; knowing the variety and obduracy of facts, institutions, and human nature; understanding what one's real motives are; how to cope and deal with the major tragedies and dilemmas of life, and with the major good things too. (Nozick 1989: 269)

Thus, according to Nozick, wisdom especially encompasses the following three points: (1) being capable of giving priority to acknowledging and mastering disadvantages ('dangers', 'limitations', 'tragedies' and 'dilemmas') over acknowledging and mastering advantages ('opportunities'); (2) being capable of giving priority to adapting ourselves to circumstances ('obduracy of facts, institutions, and human nature') over adapting circumstances to ourselves; and (3) being capable of giving priority to the vison of the whole ('a long-term view') over the vision of the parts. Finally, it is worth quoting Kekes, according to whom wisdom as practice-oriented knowledge shows up in: 'The evaluative attitude … [that] is personal, not theoretical; anthropocentric, not metaphysical; context-dependent, not universal; and humanistic, not scientific' (Kekes 2020[4]), in that 'in reliable, sound, reasonable, in a word, good judgement … a person brings his knowledge to bear on his actions' (Kekes 1983: 277).

Thus, the historical cornerstones of wisdom's definition are the following: (1) self-awareness (especially of internal lacks and obstacles); (2) awareness (especially of external lacks and obstacles); (3) resilience, especially being adaptable and making a virtue of necessity; and (4) practice-oriented knowledge addressing the whole.

2.3 WHAT WISDOM MAY BE

Most interestingly, even the logical empiricist Reichenbach, from whom we may expect only arguments for *logos* as 'computation, reckoning', declares its lacks by touchingly rewriting Shakespeare's *Hamlet* as follows (it is worth quoting extensively):

> To be or not to be – that is not a question but a tautology. I am not interested in empty statements. I want to know the truth of a synthetic statement: I want to know whether I shall be. Which means whether I shall have the courage to avenge my father. Why do I need courage? It is true, my mother's husband, the king, is a powerful man and I shall risk my life. But if I can make it plain to everybody that he murdered my father, everybody will be on my side. If I can make it plain to everybody. It is so plain to me. Why is it plain? I have good evidence. The ghost

[4] Words reported as officially describing the monograph. For wisdom in contemporary philosophy, see, for example, Maxwell (1984), Zagzebski (1996), Ryan (1999) and Tiberius (2008).

> was very conclusive in his arguments. But he is only a ghost. Does he exist? I could not very well ask him. Maybe I dreamed him. But there is other evidence. That man had a motive to kill my father. What a chance to become king of Denmark! And the hurry with which my mother married him. My father had always been a healthy man. It's a good piece of indirect evidence. But that's it: nothing but indirect evidence. Am I allowed to believe what is only probable? Here is the point where I lack the courage. It is not that I am afraid of the present king. I am afraid of doing something on the basis of a mere probability. The logician tells me that a probability has no meaning for an individual case. How then can I act in this case? That is what happens when you ask the logician. The native hue of resolution is sicklied over with the pale cast of thought. But what if I should start thinking after the deed and find out I should not have done it? Is the logician so bad? He tells me that if something is probable I am allowed to make a posit and act as though it were true. In doing so I shall be right in the greater number of cases. But shall I be right in this case? No answer. The logician says: act. You will be right in the greater number of cases … I shall know it for certain? There is no certainty. The probability will be increased and my posit will have a higher rating. I can count on a greater percentage of correct results. That is all I can reach. I can't get away from making a posit. I want certainty, but all the logician has for me is the advice to make posits. There I am, the eternal Hamlet. What does it help me to ask the logician, if all he tells me is to make posits? His advice confirms my doubt rather than giving me the courage I need for my action. (Reichenbach 1951: 250–251)

The question we should try to answer is the following: may we remedy logic's lacks with wisdom? More precisely, if logic especially lacks the capacity to give us 'the courage I need for my action' when we need to act in most challenging circumstances – in that logic gives us only 'what is only probable', 'a mere probability', something that makes us 'right in the greater number of cases' – then may wisdom give us something key to address what logic cannot sufficiently address, that is, our 'individual case', 'this case'? Even more precisely, if logic especially lacks the capacity to give us 'certainty' whenever we need to act in most challenging circumstances – in that logic gives us only something underpinned by 'good evidence', 'arguments', 'a good piece of indirect evidence' – then may wisdom give us something key to address what logic cannot sufficiently address, that is, good reasons to act even though 'There is no certainty'?

I start with an example, which can not only help to clarify the issue of the relationship between uncertainty[5] and wisdom, but also further develop the notion of wisdom itself, which can finally be tested in other uncertain scenarios that may be promisingly faced by making wisdom work together with antifragility (as logic cannot do). For instance, consider the uncertain scenario of the current pandemic, whose uncertainty is given both by the novelty of

[5] I use the word 'uncertainty' by referring to Keynes (see especially the following note).

the disease caused by the novel virus, and by the complexity of the variables implied by a global and quickly changing scenario. We may ask: what can give us good reasons to act, that is, to be vaccinated as soon as the novel vaccine is at our disposal, even though we cannot know the long-term consequences of a novel vaccine based on a novel technology? We may also use Keynes's words as follows: what can give us good reasons to act, that is, to be vaccinated as soon as the novel vaccine is at our disposal, even though 'We simply do not know' (Keynes 1979: 114[6]) the long-term consequences of a novel vaccine based on a novel technology? As the increasing number of anti-vaxxers shows, finding 'the courage I need for my action' may be most difficult when 'There is no certainty'. Yet, wisdom may help us, as follows.

First, wisdom as self-awareness (especially of internal lacks and obstacles) can recommend us to address our contingent fears, which may make us react irrationally. Specifically, as the increasing number of anti-vaxxers shows, we may react by rejecting one novel vaccine (whose long-term consequences are uncertain) and accepting another equally novel medicine (whose long-term consequences are equally uncertain).

Second, wisdom as awareness (especially of external lacks and obstacles) can recommend us giving priority to the part of reality we know more about, that is, the current pandemic's short-term consequences (which we know as dramatic both individually and socially, from health to education to economy to fairness), over the part of reality we know less about, that is, the novel vaccine's long-term consequences (which we do not know).

Third, wisdom as resilience, especially as being adaptable and making a virtue of necessity, can recommend us to exercise and develop virtues that can be promising to face whatever circumstance (from certain ones to uncertain ones), starting with the virtue of farsightedness against shortsightedness and the virtue of humility against narcissism. Specifically, both as citizens and especially as experts, from scientists to politicians, exercising our farsightedness may mean considering the impact on other individuals of what we say

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[6] More precisely:
By 'uncertain' knowledge, let me explain, I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty; nor is the prospect of a Victory bond being drawn. Or, again, the expectation of life is only slightly uncertain. Even the weather is only moderately uncertain. The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth-owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know. (Keynes 1979: 113–114; see also Hansson 1996)

and write, by overcoming our own shortsighted individualism. And exercising our humility may mean renouncing media exposure if it may be confusing for other individuals, by overcoming our own narcissistic individualism.

Fourth, wisdom as practice-oriented knowledge addressing the whole can recommend us to exercise and develop our imagination, starting with imagining the potential long-term consequences of our own actions. Specifically, we may imagine two different scenarios. In the first scenario, we may imagine that the novel vaccine will turn out not to be sufficiently safe in the long run. We have at least two different questions to answer. First, if we decided to be vaccinated, then what might our own actions' potential long-term consequences be for the whole (as defined above, including the complex spheres of our health, others' health, our morality, our society and future generations)? Second, if we decided not to be vaccinated, then what might our answer be? In the second scenario, we may imagine that the novel vaccine will turn out to be sufficiently safe in the long run. In both scenarios, imagining the balance between, for instance, our health and our morality is not trivial at all (which is the reason why imagining is a great exercise to develop our own wisdom).

More precisely, we may imagine the balance between our health and our morality as follows. First, if we decided to be vaccinated, then how might we answer the following question: that is, what are the destinies of our health and our morality when we consider that we actually rely on vaccines whose long-term consequences were tested on other individuals (who gave us the opportunity to be safer in our present) and, at the same time, we accept testing the novel vaccine's long-term consequences on ourselves (giving other individuals the opportunity to be safer in their future)? Second, if we decided not to be vaccinated, then how might we answer the following question: that is, what are the destinies of our health and our morality when we consider that we actually rely on vaccines whose long-term consequences were tested on other individuals (who gave us the opportunity to be safer in our present) and, at the same time, we reject testing the novel vaccine's long-term consequences on ourselves (not giving other individuals the opportunity to be safer in their future)?

Thus, the key reason why wisdom may help us find 'the courage I need for my action' when 'There is no certainty' is that it can give us several good reasons to act anyway: wisdom is a form of rationality that can promisingly complement logic when it comes to facing challenges implying uncertain scenarios – that is, when 'There is no certainty' 'in this case' – in that it can give us reasons to act that can be good even though they cannot be 'certain'.

Giving good reasons to act when there are no 'certain' reasons to act is also the key reason why wisdom can promisingly work together with antifragility when there is the need to decide and act even in the most uncertain scenarios. Before moving from the example of the current pandemic to an example that

can make the relationship between wisdom and antifragility more explicit, the example of the current pandemic can be used to integrate wisdom's historical definition as follows. Under the four points above, imagination is always at work, sometimes explicitly and sometimes implicitly. Regarding wisdom as self-awareness, imagination can identify not only actual internal lacks and obstacles, but also potential internal lacks and obstacles (which stresses wisdom's special foresight). Regarding wisdom as awareness, imagination can identify not only actual external lacks and obstacles, but also potential external lacks and obstacles (which stresses, again, wisdom's special foresight). Regarding wisdom as resilience (especially as being adaptable and making a virtue of necessity), imagination can identify possible ways of being adaptable and making a virtue of necessity (which stresses, again, wisdom's special foresight). Regarding wisdom as practice-oriented knowledge addressing the whole, imagination can identify the whole as the complex relationships of something particular with something general, from one's short-term consequences and long-term consequences for oneself, to one's short-term consequences and long-term consequences for other individuals (which stresses, again, wisdom's special foresight).

Thus, wisdom's historical definition can be integrated as follows: wisdom is what can make us foresightedly imagine a complex series of things, that is, actual and potential lacks and obstacles, both internal and external, possible ways of being adaptable and making a virtue of necessity, and the whole as the complex relationships of something particular with something general, from one's short-term consequences and long-term consequences for oneself to one's short-term consequences and long-term consequences for other individuals. Wisdom is the form of rationality that can make us foresightedly imagine especially what we cannot know as at least probabilistically 'certain', that is, what is uncertain.

Speaking of uncertainty does not mean speaking of something that cannot be rationally addressed: it means speaking of something that can be addressed by forms of rationality promisingly complementary to logic, starting with wisdom. Metaphorically speaking, wisdom can promisingly complement logic as follows. First, if it is true that logic walks on solid ground (a kind of certainty, metaphorically speaking), whereas wisdom walks on quicksand (a kind of uncertainty, metaphorically speaking), it is also true that the latter can walk precisely where the former cannot walk; especially, it is also true that quicksand (uncertainty) is not only more extended than solid ground (certainty), but also increasing in our era. Second, if it is true that logic is vertical and can make us see the parts in detail, whereas wisdom is horizontal and can make us glimpse, at most, the whole, it is also true that the latter can make us glimpse precisely what the former cannot make us see. Third, if it is true that logic is shortsighted and can make us see the present, whereas wisdom is farsighted

and can make us glimpse, at most, the future, it is also true that the latter can make us glimpse precisely what the former cannot make us see. Fourth, even more metaphorically speaking, if it is true that logic may lead us to a kind of attitude to individualism, both epistemologically and ethically, which results from focusing on the parts in detail, whereas wisdom may lead us to a kind of attitude to altruism, both epistemologically and ethically, which results from focusing on the whole, it is also true that the latter may make us somehow exercise precisely the kinds of epistemological and ethical attitudes that the former may not, starting with the focus both on our possible future interests and on other individuals' possible future interests.

2.4 WISDOM AND ANTIFRAGILITY

The integration of wisdom's historical definition with a further stress on imagination leads us to define wisdom as the form of rationality that can make us foresightedly imagine especially what we cannot know as at least probabilistically 'certain', that is, what is uncertain. More precisely, wisdom is the form of rationality that can make us foresightedly imagine: (1) actual and potential lacks and obstacles, both internal and external; (2) possible ways of being adaptable and making a virtue of necessity; and (3) the whole as the complex relationships of something particular with something general, from one's short-term consequences and long-term consequences for oneself, to one's short-term consequences and long-term consequences for other individuals. If we go back to the definition of antifragility, then we find the following words: antifragility is precisely what can 'benefit from shocks', specifically 'shocks … volatility, randomness, disorder, and stressors and … adventure, risk, and uncertainty'. At least two key analogies between wisdom and antifragility show up: first, they address uncertainty, and second, their way of addressing uncertainty is a matter of making a virtue of necessity. But wisdom and antifragility do not coincide at all: if we think of the latter as the quality of what (and of whom) can 'benefit from shocks' and uncertainty, then we think of the former as the form of rationality that can lead to 'benefit[ting] from shocks' and uncertainty; we may think of wisdom as the form of rationality that can underpin antifragility as the quality of what (and of whom) can 'benefit from shocks' and uncertainty.

Again, wisdom is not alone when it comes to addressing 'shocks' and uncertainty. As the current pandemic shows, logic can serve as a powerful form of rationality, from analysing the possible causes of a shock to predicting its possible effects. Yet, when the possible effects of such a phenomenon increasingly move from risk to uncertainty, wisdom can serve as an equally powerful form of rationality complementing logic. For instance, when we cannot know whether a novel variant of the novel virus will show up and what its effects will

be, we can add wisdom to logic, which means that we can use the latter to work on more and more sophisticated technologies to make more and more versatile vaccines and, at the same time, we can use the former to work on our present and future actions. More precisely, using wisdom may mean the following:

1. Foresightedly imagining actual and potential lacks and obstacles, both internal and external, can make us aware, for instance, of our propensity to make our lives easier, which means ceasing to rigorously respect safety measures. Thus, wisdom can recommend us continuing to rigorously respect safety measures, by doing this ourselves, and by asking other individuals to do so.
2. Foresightedly imagining possible ways of being adaptable and making a virtue of necessity can make us exercise, for instance, not only our capacity to be adaptable, which is most valuable, but also our capacity to improve our lifestyle. We learned that safety measures, from washing our hands to cleaning the air to wearing masks at least in crowded places, improved our general health. Thus, wisdom can recommend us to exploit the disadvantage of (necessarily) adapting to something bad for us as the advantage of (virtuously) improving something good for us.
3. Foresightedly imagining the whole as the complex relationships of something particular with something general, from one's short-term consequences and long-term consequences for oneself to one's short-term consequences and long-term consequences for other individuals, can make us exercise, for instance, our capacity to plan for the future in a wiser way both individually and socially, as follows. First, by working on the causes of the shock we face, starting with trying to improve our relationship with natural ecosystems. Second, by working on the effects of the phenomenon we face, starting with trying to improve not only our lifestyle in terms of respecting safety measures, as we have seen, but also our lifestyle in terms of improving our daily lives' adaptability, from when and where we can work to reshape our homes, our workplaces of whatever kinds (the list may be endless, including 'when', 'where' and the 'way' they characterise our daily lives both individually and socially).

It makes sense that our reflection leads us to the following point: if it is true that we may think of wisdom as the form of rationality that can underpin antifragility as the quality of what (and of whom) can 'benefit from shocks' and uncertainty, it is also true that wisdom's essential underpinning of antifragility may be thought of as a special kind of rational readiness. More precisely, wisdom's essential underpinning of antifragility may be thought of as a special kind of rational readiness that can make us exercise our constructive adaptabil-

ity to what can only be imagined, specifically by trying to glimpse the whole as extended scenarios, especially as extended worst-case scenarios.

If we go back to the paradoxical example of our cities (the less fragile they seem to become, by becoming increasingly technological, specifically digital, the more fragile they seem to become, by being increasingly hackable precisely through digital technologies), then we may reflect as follows. If we 'Imagine residents unable to enter (or to leave) certain buildings, life-saving systems such as fire-suppression networks remotely jammed by hacking, or even entire communities blocked from crossing automated roadways' (Manaugh 2021: 76), then how may wisdom underpin antifragility? The answer I have proposed is a matter of wisdom's capacity to make us and, finally, our cities ready to be constructively adaptable to what can only be imagined as extended worst-case scenarios (which may coincide with 'residents unable to enter (or to leave) certain buildings, life-saving systems such as fire-suppression networks remotely jammed by hacking, or even entire communities blocked from crossing automated roadways'). Again, how may wisdom underpin antifragility? It may do so as follows.

Foresightedly imagining actual and potential lacks and obstacles, both internal and external, can make us aware, on the one hand, of our propensity to make our lives easier, which means relying on what is easier to manage, starting with autonomous infrastructure systems to which we increasingly shift our autonomy;[7] and, on the other hand, that the more powerful (and autonomous of nonexperts) infrastructure systems are, the more powerful (and autonomous of nonexperts) their damages are. Thus, wisdom can recommend us, on the one hand, continuing to exercise our autonomy at least in a series of contexts that can develop it (for instance, from our capacity to autonomously fix, to our capacity to autonomously make decisions), and on the other hand, working on 'plan Bs', which means, philosophically speaking, trying to move damages from being irremediable (both individually and socially) to being remediable (both individually and socially). And how may wisdom, as we have defined it, underpin antifragility? On the one hand, wisdom can make us more and more antifragile, starting with making us develop our autonomy; and on the other hand, wisdom can make our cities more and more antifragile, starting with not absolutising their being digital, which means not only working on 'plan As' as much as working on 'plan Bs' but also that, if our cities continue to be partly analog, then promising 'plan Bs' should be partly analog. Trivially, an analog agenda can be a promising plan B for a digital agenda. Less trivially, mechanical systems to fix 'life-saving systems such as fire-suppression networks'

[7] I myself worked on the issue of trading human autonomy for technological automation (in Chiodo 2023). I also worked on the issue of wisdom in Chiodo 2022.

can be promising 'plan Bs' for 'life-saving systems such as fire-suppression networks' themselves.

Foresightedly imagining possible ways of being adaptable and making a virtue of necessity can make us exercise not only our capacity to be adaptable, which is most valuable, but also our capacity to improve our lifestyle, in that, for instance, if 'entire communities [are] blocked from crossing automated roadways', then we can walk. I think that many of us increasingly experience that whenever something digital stops working, then we equally stop working – that is, start panicking – which means that we equally stop foresightedly imagining what capacities of ours we can continue to rely on. For instance, trivially, and moving from digital technologies to other technologies, when the first pandemic lockdown started, I panicked because of my fear of using public transport from home to workplace. But, after having panicked, I imagined that I could walk at least 4 kilometres a day, and even 8 kilometres (that is, the round trip). I started doing this two years ago, and after having experienced that the more I walk, the better I feel both physically and mentally, walking at least from workplace to home several times a week has become a promising routine way to improve my lifestyle. Less trivially, if 'entire communities [are] blocked from crossing automated roadways', then in addition to working on analog, that is, mechanical, systems, we can walk and, consequently, improve our lifestyle, at least to get to an alternative solution. Thus, wisdom can recommend us not to panic and, conversely, to imagine alternative solutions that may even make us improve.

And how may wisdom, as I have defined it, underpin antifragility? Wisdom can make us more and more antifragile, starting with making us develop not only our capacity to be adaptable, which is precisely what can save us in these examples, but also our capacity to improve our lifestyle, which is precisely what making a virtue of necessity means in these examples.

Foresightedly imagining the whole as the complex relationships of something particular with something general, from one's short-term consequences and long-term consequences for oneself to one's short-term consequences and long-term consequences for other individuals, can make us exercise our capacity to plan for the future in a wiser way, both individually and socially, as follows. First, from an individual perspective, by working on, and improving, individual capacities, from autonomy and adaptability to wisdom and antifragility themselves, which means finally developing individual readiness to face causes and effects of future novel phenomena. Second, from a social perspective, by working on, and improving, social capacities, starting with something that experiences a crisis in our individualistic society, as the current pandemic shows: the social capacity to join forces. Which means not only the social capacity to teamwork but also, and especially, the social capacity to measure up to something exceedingly wise, that is, Kant's categorical imperative,

according to which our actions should result precisely from our foresightedly imagining their possible universal consequences, to the point that we should 'act as if the maxim of … [our] action were to become by … [our] will a universal law' (Kant 1785: 421).

Thus, wisdom can recommend us, first, working hard on ourselves as individuals, in that even though novel phenomena quickly change, our individual capacities to face novel phenomena do not equally quickly change; and second, working hard on ourselves as a society, in that both teamworking and, especially, foresightedly imagining our actions' possible universal consequences can even save present and future human lives. And how may wisdom, as I have defined it, underpin antifragility? Wisdom can make us more and more antifragile, starting with making us more ready when it comes to facing novel phenomena as individuals and more ethical when it comes to facing novel phenomena as a society (and being more ethical is precisely the first outcome of Kant's categorical imperative). Finally, wisdom can make our cities in particular, and our artefacts in general, more and more antifragile, starting with making them something in which the whole can be much more than the sum of the parts; which means, again, that ethics plays a key role: we may even say that, if we become capable of planning more and more ethically, which, especially in global scenarios, means giving priority to society over individuals, then our cities in particular, and our artefacts in general, will be more and more antifragile (as I shall at least start to argue in the conclusion).

2.5 CONCLUSION

The examples upon which I have reflected show that good reasons to act, even though they cannot be 'certain', in that 'There is no certainty' – specifically, 'We simply do not know' – are frequently characterised by something ethical. The words 'foresightedly imagining', which I have repeatedly used, frequently mean addressing the whole, especially our actions' consequences for other individuals, and this means imagining in an ethical way. Antifragility as underpinned by wisdom may be thought of as the quality of what, and of whom, can 'benefit from shocks' and uncertainty, precisely by being frequently underpinned by imagining in an ethical way.

One last example may serve to at least begin clarification. If conspiracy theorists tell us that we cannot prove to them that the current pandemic does not result from a global conspiracy (which is the reason why they are not vaccinated), then what we can do to contribute to making our society more antifragile is not the following (logical) answer: 'Even you cannot prove to us that the current pandemic results from a global conspiracy'; which may start a kind of vicious circle, making our society less antifragile, being torn. Conversely, we may (wisely) answer: 'Since both of us cannot prove anything, let us imagine,

first, how we are likely to affect the whole of our society if we decide not to be vaccinated and, second, how we are likely to affect the whole of our society if we decide to be vaccinated. And let us act accordingly.' Which means, again: 'Since "There is no certainty", specifically "We simply do not know", let us imagine and assess our actions' ethical quality.'

There are are at least two (good) reasons why (wisely) imagining and assessing our actions' ethical quality may make our society more antifragile. First, if conspiracy theorists turn out to be wrong, then we will have contributed to make our society more antifragile, being less torn, by having saved more present lives. Second, if conspiracy theorists turn out to be right, then we will have contributed to make our society more antifragile, being less torn, not only by having saved more present lives, but also by having given us, and other individuals, a reason to act that, by being good even without being true, can save us anyway, in that what can be saved is precisely our awareness of our actions' ethical quality. Being aware, at least, of our actions' ethical quality, whenever ethics does not mean truth, is precisely what can make us 'benefit from shocks' and uncertainty; that is, more antifragile both as as individuals and as citizens serving our (equally more antifragile) society.

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3. Antifragility: politics and common knowledge

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3.1 PREMISE AND DEFINITIONS

This chapter has a twofold objective. First, it aims to critically analyse some concepts used in the literature on fragility and antifragility, with reference to the territorial dimension. Second, it advances and discusses the hypothesis according to which effective strategies to contrast territorial fragility should avoid the risks of depoliticisation and technicalisation, assuming the central role of common knowledge and discourses.

The topics addressed in this chapter were at the core of my reflection on the research activities carried out within the 'Departments of Excellence – Territorial Fragilities' research programme funded by the Italian Ministry of University and Research, which I have coordinated since 2020. Some of the themes developed here were previously discussed in my book *Coping with the Pandemic in Fragile Cities* (Pasqui 2022), where the issue of the fragility and antifragility of territories was observed from the perspective of the effects of the COVID-19 pandemic on cities and on policy and planning tools.

I start by proposing some definitions which serve as an introductory orientation and cannot be discussed in depth here. By 'territorial fragility' I mean a process (and not a state) that generates instability in a territory, jeopardising its ordinary dynamics of transformation and generating natural and social fractures and crises. Territorial fragility is a multidimensional, social and natural process in which various factors cooperate to produce imbalances and crises. Fragility is the effect of the economic and political treatment of natural resources, and it always occurs as a multiscale and multidimensional phenomenon. Global events such as the crises related to climate change and the recent pandemic cannot, therefore, be considered natural events. They are generated and subsequently addressed and treated within complex socio-technical systems and conflictual economic and political interests (Ernstson and Swyngedouw 2019).

The process that I define as territorial fragility is closely connected with a condition of radical uncertainty, a condition that has been studied in many different research fields (Kay and King 2020). By 'radical uncertainty', I mean a condition in which events cannot be traced back to probabilistic logics. This implies that radical uncertainty cannot be erased, as it has a permanent nature, it is part of our lives. Radical uncertainty has to do with ambiguity and vagueness in the definition of problems, but also with the total absence of awareness of what we know and what we do not know. We are in a situation in which we face 'unknown unknowns', that is, future outcomes, events, circumstances or consequences that we cannot predict or imagine. Radical uncertainty, unlike risk, cannot be calculated and it is absolutely unpredictable by its very nature.

In a situation of radical uncertainty, strategies to prevent crises in fragile territories should take into consideration the non-calculable nature of the events resulting from fragility. In the following discussion, 'events' are intended as facts that break the continuity of social and natural processes and also disrupt the forms of interpretation and sensemaking within which we name them and give them sense.

Following Nassim Nicolas Taleb, I define an 'antifragile territory' as a spatial context that does not merely withstand a shock, but improves because of it. In this perspective, the concept of antifragility goes beyond robustness. In his book *Antifragile: Things That Gain from Disorder*, Taleb (2012) offers the following definition:

> Some things benefit from shocks; they thrive and grow when exposed to volatility, randomness, disorder, and stressors and love adventure, risk and uncertainty. Yet, in spite of the ubiquity of the phenomenon, there is no word for the exact opposite of fragile. Let us call it antifragile. Antifragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better. (Taleb 2012: 3)

Another relevant concept that I will use is that of 'preparedness'. Using a conceptual framework that originally emerged in the field of healthcare, Alessandro Balducci (2020) emphasised that talking about preparedness means identifying an approach to the imponderability of crises based on a capacity for reaction that is valid in the most diverse range of post-catastrophe situations. Preparedness, following Andrew Lakoff (2007, 2017), may be defined as:

> a form of planning that takes on the objective of preparing for the unexpected through scenario construction, the protection of critical communication infrastructures, the provision of devices that facilitate coping in different types of emergencies, commissioning immediately activated alarm systems, designing systems for coordinating different subject, and periodic verification of these operations … Preparedness for the incalculable disasters arising amidst growing social, economic and environmental instability means constructing not the solution, but the capacity to react in the face of the things we don't know we don't know. (Balducci 2020: 24)

In the following sections I develop some criticisms of the concepts of preparedness and antifragility (section 3.2), also through comparison with the political ecology approach (section 3.3). Later, assuming the centrality of knowledge and language in the analysis of depoliticisation processes (section 3.4), I take the work of Charles E. Lindblom on common knowledge and probing as a reference point for an antifragile approach to planning (section 3.5).

3.2 SOME CRITIQUES TO PREPAREDNESS AND ANTIFRAGILITY

The concepts of antifragility and preparedness are very useful for reflecting on the approach to use in fragile territories. Both highlight the unpredictable and incalculable nature of the crises that can affect fragile systems and territories. However, both concepts can be read in a key that exposes them to risks of depoliticisation and technicalisation of territorial fragility problems.

Taleb's idea of antifragility, according to which it is possible to gain from disorder, often renounces recognising the social and political nature that connotes the condition of fragility and ends up thinking of fragility and antifragility as natural conditions and processes. As Taleb wrote in the final glossary of his 2012 book, nature should be able to prevent and manage risk better than rational human beings. This means that antifragility is a useful critique of ingenuous rationalism, but is also a perspective that weakens the conflict and the clash between opposing interests.

A territory can assume an antifragile configuration if social and institutional actors can recognise the unavoidable nature of uncertainty and incalculability. On the other hand, antifragility strategies should also be considered as political processes, within a conflictual context in which the meaning and values of a territorial development model are re-defined.

It is therefore a question of understanding that if fragility is the effect of a set of political, social and natural causes, then antifragility is also necessarily a political and social construct. Assuming this perspective, how can we exploit the concept of antifragility in the field of planning? And why might it be useful to us? First of all, it is important to underline that the COVID-19 pandemic brought about a significant paradigm shift, at least within Europe, with regard to public investment and intervention, providing Member States with a number of resources that had never been made available before in the last 30 years.

It is therefore a matter of using these resources effectively. However, we must first understand what kind of planning we most need, given that it is a question of coming up with plans and schemes for complex social and territorial systems in the absence of a strong ability to predict the future. As Ivan Blečić and Arnaldo Cecchini wrote in a volume that proposes a complex antifragile approach to planning (Blečić and Cecchini 2016), we should think about

the future without foreseeing it, exploiting the now extremely long-standing debate on the limits of rational planning, and embracing the need to accept our weak capacity for prediction as a guideline for action. Blečić and Cecchini believe that antifragile planning accepts radical uncertainty as an unavoidable fact, and they propose three main moves for experimenting with forms of planning that are capable of tackling – or rather, engaging with – disorder.

First of all, antifragile planning advocates for a 'negative way', that is, the ability to offer indications about what it would be best to avoid doing, through rules and restrictions capable of fostering resilience and antifragility, limiting superfluous rules as much as possible, and establishing a framework of long-term rules and standards – all precautionary in nature – that are also able to incorporate some principles of fairness and equality.

Second, antifragile planning adopts a principle for action consisting of establishing a set of desired scenarios; shared visions that it is hoped will come to fruition. These shared urban visions are aimed at increasing empowerment, according to Amartya Sen's view, by involving the inhabitants as agents of the transformational process.

Finally, when faced with negative rules and the production of visions, it is planning that provides the flexibility required not only to allow social actors to preserve their autonomy, but also to permit social and institutional actors to generate and implement good ideas. Planning is therefore the ground for concrete experimentation with different plans for living.

Following Blečić and Cecchini, re-politicising the concept of antifragility, therefore, means affirming that it is not a matter of a state or a natural process. To assume an antifragile configuration, a territory must shift resources and re-define powers.

Similar considerations can be proposed with reference to the concept of preparedness. Ash Amin, amongst others, offered a sensitive reflection on the potential ambiguities of the concept of preparedness, pointing out the conditions under which a culture of being prepared can also be used as a tool for democratisation. In the chapter 'From Protection to Preparedness' of his *Land of Strangers*, Ash Amin pointed out that securing both citizens and borders had been an obsession shared by many Western governments throughout the second half of the 20th century (Amin 2012).

Also based on this context – in which the nuclear threat has gradually been joined by other types of natural and social risks – a widespread culture of risk management has grown enormously. In Amin's view, this has shifted the emphasis from the perspective of providing universalistic services to that of building tools to increase individual resilience in the face of adversity. From this point of view, the move from the logic of insurance against risk to that of preparedness represents an interesting innovation element, on account of the

'transition from a culture of total protection and risk avoidance to one of joint responsibility and risk mitigation' (Amin 2012: 146).

If we consider preparedness to be a form of shared responsibility, we must nonetheless be mindful of how it can be used in an ideological and manipulative way. As Amin wrote, we are invited to:

> [re-think] the meaning of preparedness for a turbulent future. Today, it has come to signify – at least in the neoliberal world – preparing for the worst and aggressively pushing back at identifiable sources of harm, while accepting that some sacrifices are sources (usually the vulnerable and undefended). This thinking needs to be reversed by adding more anticipatory and protective measures to the available arsenal, by minimizing the potential of damage and maximizing the capacity to resist and recover. If such thinking takes us back to arguments for central planning and state responsibility, extensive expertise, comprehensive insurance and protection, precautionary and peaceful actions, automated maintenance and repair, let it do so, without temptation to be apologetic, ashamed about some putative return to an age of centrism. (Amin 2012: 162–163)

The main point of the criticisms made against the concepts of antifragility and preparedness is the need to avoid any naturalistic approach to the condition of natural and social fragility. As already pointed out, the natural (seismic, hydrogeological, climatic) fragilities of a territory are closely connected to unsustainable production processes, and power relations between classes and social groups. Therefore, being prepared, being resilient and antifragile is not an individual choice, but is rather a political decision which calls into question the balance of power and the structures of the development model.

In the long years in which the axis shifted from public to private, from institutions to the market, we ended up thinking that the response to crises and catastrophic events could be restricted to the individual and household sphere or to small groups, whereas the pandemic itself has shown that it is impossible to cope with crises of a global nature – with which the market is absolutely unable to deal – without the institutions taking on a central role.

3.3 POLITICS AND DEPOLITICISATION: THE POLITICAL ECOLOGY APPROACH

The wonderful novel *Salvage the Bones*, by the American writer Jesmyn Ward, tells the story of a working-class African-American family living in southern Mississippi (Ward 2011). The family consists of Daddy, his daughter Esch (the narrator) and his sons Randall, Skeetah and Junior. Their mother died while giving birth to Junior. The family is in a condition of extreme financial, cultural and social poverty.

The father, listening to the news and based on his experience, realises that the expected Hurricane Katrina will be very violent, and tries to prepare, even if they have no other place to go. Daddy fixes the doors and windows of the shack in which they live with wooden boards and waits for the hurricane to hit.

Soon afterward, Hurricane Katrina hits. The family is forced into the attic and eventually onto the roof as water begins to flood into their home. As the water continues to rise, they make a desperate bid to swim to another house on a hill. After the end of the storm, the entire town has been levelled, leaving the family poorer and more desperate.

The novel shows that there are several ways to be prepared, which depend on resources and skills that are distributed asymmetrically. As also highlighted by scientific studies (Kroll-Smith 2018), Hurricane Katrina was an example of the fact that the effects of natural events are also social facts.

In a situation of dramatic social inequalities, how can we add a critique of a 'naturalistic' conception of the notions of preparedness and antifragility in the contemporary urban studies international debate? My suggestion is to connect this discussion to the political ecology approach. In the context of geography and critical urban studies, the issue of the politicisation of ecological discourse has been at the core of attention for almost 20 years.

Inspired by the work on the perspectives and decline of the 'political' by philosophers such as Ranciere (1998) and Mouffe (2005), many scholars of urban phenomena and territorial and environmental problems have underlined how the theme of climate change-connected risks and the radical condition of ecological imbalance (that some have named the 'Anthropocene') is often removed from the nature and political causes of risk situations connected with climate change and pandemics.

In the last 20 years, one of the most significant contributions to the analysis of depoliticisation of the ecological issue has been that of Eric Swingedouw. In the book he edited with Henrik Ernstson, *Urban Political Ecology in the Anthropo-Obscene* (Ernstson and Swyngedouw 2019), Swyngedouw radicalised the positions already advanced in the early 2000s (Swyngedouw 2014). For example, in an important article published in 2003 with Amanda Haynes, they wrote:

> It is exactly this mobilisation and transformation of nature and the allied process of producing new socioenvironmental conditions that are at the heart of Marxist political ecology … Such perspective, in turn, recognises the acting of nonhuman actors, as suggested by Action Network Theory, but insists on the social positioning and political articulation of such 'acting'. (Swyngedouw and Heynes 2003: 902)

This implicit critique of some potential consequences of the actor-network approach proposed by Bruno Latour and other scholars highlights the need to

recognise the political and conflictual dimension of the production of urban nature. In the last years, Swyngedouw and Ernstson have spoken of a 'depoliticised politics of the Anthropocene' (Swyngedouw and Ernstson 2019: 35).

The same critique of the 'Anthropo-Scene', as Swyngedouw has called it, is proposed by Italian philosopher Roberto Ciccarelli. In a recent, interesting book (Ciccarelli 2022), he has criticised the different rhetoric of the natural catastrophe, showing the different forms of depoliticisation of many 'apocalyptical' discourses. In his perspective, the climate crisis is the product of human domination and there is nothing 'natural' about it. Its driving force is a society based on extractive logic, class domination and inequality (Foster et al. 2010).

One of the elements of greatest interest in Ciccarelli's work is the attention to language, discourses, narratives and rhetoric. The implicit depoliticisation in several discourses and knowledge connected to the themes of territorial fragility is above all an abdication of the common language of politics towards technical jargons. In this perspective, adopting a political ecology approach to antifragility entails, in the first instance, a 'care of discourses' (Sini 2021), a work on languages, an attitude of suspicion towards the neutrality of technical solutions and expert knowledge.

So, how does the depoliticisation of the preparedness and antifragility notions work? In the first place, as already pointed out by Amin (2012), it works by individualisation; that is, when preparedness or antifragility is traced back to the response of individuals, households or small groups. This form of depoliticisation thus removes the action of individuals and social groups, as well as that of institutions, from the domain of politics, aimed at countering the potential negative effects of territorial fragility.

From a 'political' perspective, being prepared means building structural conditions that make it possible to counter the catastrophic effects of unpredictable events, carrying out significant public disturbances, and assuming that the effects of events weigh differently on individuals, families and social groups. Similarly, to be antifragile we need institutions that function adequately as well as financial, relational and cognitive resources that can be mobilised even by the most disadvantaged. Both the catastrophic effects and extreme events related to climate change and the impacts of the pandemic have shown that in the absence of capacities and tangible and intangible resources, it is the poorest who suffer the most from the negative effects of territorial fragility (Ryan and Nanda 2022).

Preparedness requires money, social capital, and cognitive resources: it is a collective effort and an institutional device. Antifragility can be politicised if it becomes the result of a political and social process of redistribution of resources.

3.4 COMMON DISCOURSES AND POLITICAL DEBATE

I would like to introduce a further dimension of depoliticisation and, consequently, a strategy for promoting a possible re-politicisation of antifragility. The notion of antifragility can avoid the risks of depoliticisation if it is able to rely on the relevance of common discourses. Common discourses are those that we use every day, those that characterise the practices of daily life. Experts also use common language when engaged in social interaction processes and communicative practices.

The pandemic has induced us to become suspicious about expert views and technical solutions usually taken as neutral. In particular, the huge number of views and opinions on the pandemic warns us about the need to use utmost caution regarding the alleged neutrality of scientific discourse. Building a space for political discourse as a common discourse does not absolutely mean rejecting the results of research and demonising science. However, a suspicious attitude should continuously be kept towards any discourse that intends to present scientific research, its outcomes and indications, as neutral, objective and indisputable (Latour 1999).

Since the first and most severe lockdown (for example, in Italy from March to June 2020), we have been hit by an incredible number of common, scientific and political discourses. These endless discussions and debates were often rooted in the medical dimension of the pandemic – its dramatic effects on health, its dynamics, its epidemiological spread – but also discussed its causes and its relationships with other phenomena (political, environmental and psychological, to name but a few). The words of experts have literally invaded our lives, our television and computer screens, newspapers, magazines and social networks.

I am not knowledgeable enough to perform an analysis of these discourses, their contradictions, the changes in direction of experts who apodictically assert scientific truths which a few days later they will disprove, or to analyse debates and arguments between virologists and epidemiologists in TV studios, or the thousands of hours of broadcasts jam-packed with operational instructions on how to contain the epidemic and limit its effects on our daily lives.

However, I would like to stress that any such analysis should be carried out with utmost care and caution. First, we should ask ourselves what the legitimacy and authority principles are that underlie these often contradictory and certainly ever-changing assertions. Indeed, the arena in which these experts delivered their pronouncements – influencing not only our lives, but also political decisions – was not usually that of peer-reviewed scientific discussion, but was rather that of the public sphere and common discourse. This means that the

mechanisms by which these discourses, their influence and their effectiveness have been legitimised were not based on the scrutiny and verification systems that are typical of scientific research, but rather on other typical accreditation and legitimisation processes of the public sphere.

Second, we should be able to follow the thread of the 'invisible power' – to borrow an expression from the Italian philosopher Carlo Sini (2016) – that pervades these discourses without their authors even being aware of it, and compromises their supposed neutrality and scientific nature, whilst also casting light on how and to what extent each and every scientific claim is caught up in a web of power and knowledge in which economic and geopolitical interests as well as worldviews and contexts of meaning play an essential role. Throughout the pandemic, the discourse delivered by experts has never been 'pure'.

Finally, we should try to understand the effectiveness of these discourses, their influence on collective decisions and individual lives, and the way in which the words of expert knowledge have been reassembled into other practices of power and knowledge.

All this has nothing to do with the return of antiscientific ideas that assert the existence of conspiracies and reject the results of scientific research. An exploration of the ways in which science was used during the pandemic (both in scientific and in common discourse based on alleged scientific objectivity) would undoubtedly make for a case study of exceptional interest. On the one hand, we have seen the salvific power of science and technology come to fruition. The Web allowed medical doctors on the front lines in hospitals all around the world to share information and experiences in real time; the big data and the enormous computing power developed over recent decades, the capability of drawing upon extraordinarily effective experimental protocols, have all been essential factors without which we would not even have a vaccine today, nor the medications that are keeping the number of deaths at a minimum. On the other hand, we can hardly contain our dismay at just how irresponsible the assertions of scientists have been, given that over the past years, they have preached everything under the sun and the opposite of everything; in speeches that in more than one case have been used for political and business purposes.

This way of considering the role and pervasiveness of expert knowledge during the pandemic also applies to discourses on the city churned out not only by architects, urban planners, sociologists and anthropologists, but also by all those observing connections between urban space transformations and the pandemic.

The indication that emerges from these observations is that the political discourse is common discourse, and that we should imagine and justify antifragile strategies within the limits and possibilities of this discourse. Once again, this does not mean stopping using expert knowledge, scientific research and the available technological devices. However, it means using them while

being aware of their situated and limited nature, and assuming the interactions between powers and knowledge that define their field of action.

3.5 THE ROLE OF COMMON KNOWLEDGE IN ANTIFRAGILE PLANNING

How is it possible to take care of common discourse as a political discourse? What are the tools through which common discourse, intended as a political discourse, can play its role in the construction of antifragile projects and policies? Which opportunities do we have to avoid the depoliticisation of antifragile strategies and policies?

My guess is that 'usable knowledge', as Charles Lindblom called it, is a central tool for policy design and implementation. The theme of common knowledge is intrinsically political, as it has to do with social interaction processes. To argue this statement, I will follow Charles E. Lindblom's reflection on knowledge. In the introduction to his late masterpiece, *Inquiry and Change*, Lindblom (1990) explicitly stated that the book takes up the same themes already developed a few years earlier in *Usable Knowledge: Social Science and Social Problem Solving* (Lindblom and Cohen 1979). The text, written with David Cohen and published in 1979, explores the question of knowledge from the perspective of dissatisfaction with the role played by social sciences and social research in the field of social problem-solving.

Against the background of this interpretation of the relationship between knowledge and action exists a pragmatist inspiration. Policy and planning activities are clusters of cognitive and non-cognitive practices, acted by a multiplicity of actors who give a sense, retrospectively, to their actions, according to a modality that closely resembles that of the sensemaking processes described by Karl Weick (1995).

In the social interaction processes, meaning is always posthumous: it has to do with the ways in which we make sense of what we do and what happens. The same also occurs in planning and policy processes: although the actors, and above all the planners, are inclined to believe (technically pertinent) knowledge to be the premise for action, it is instead a possible and potential outcome of social interaction.

Of course, technical knowledge is very relevant, even when it serves to define objectives and tools for planning action, but it never works alone. The sense of what happens, starting from the interpretation of effects (that is, what planning actually produces in the context where it is applied), is the result of the common knowledge of a plurality of actors engaged in a complex practice of sensemaking.

This conception of knowledge as a product of action, which is presented in a very particular way in the book by Lindblom and Cohen (1979) is the

exact opposite of the theory of the equality of all knowledge. They are rather inscribed in webs of power, and in this sense, power and knowledge must be understood together.

The 'power of the word', of which Pierre Bourdieu (1993) spoke, is played out on several fronts and in a multiplicity of practices. First, not every word carries the same weight in the decision-making processes associated with planning activities. The expert word, as well as the word of politics, and that of established economic interests, undoubtedly have greater importance than that of other actors and stakeholders. However, it is not only about the asymmetry of power that surrounds the words spoken: it is also about the invisible power, that is, the set of discourses that work behind things and actions, making some discursive regimes possible to the detriment of others.

These considerations echo the archaeological reflection of Michel Foucault (1969) and his observation that not everything can be said at all times. The theme of invisible power and the atmosphere is instead at the heart of Carlo Sini's (2016) reflections on discursive practices and their implicit connection with a wider field of possibilities, dictated by practices of knowledge and power that anonymously define the possible boundaries as well as the field of viability and the register of our speeches.

Charles Lindblom's approach to the use of different forms of knowledge in facing social problems is based on two main concepts. The first is the concept of 'probing', defined by Lindblom as the collective effort to explore possible solutions to public problems. The quality and diffusion of probing activity in companies is limited by various forms of impairment, which limit the possibility of testing socially and politically shared solutions.

According to Lindblom, we cannot think of reducing the impairment by resorting to the authority of technical knowledge, because this authority must be tempered by the fact that even that knowledge is intertwined with the invisible power that governs its production and reproduction mechanisms. Moreover, sometimes impairment can favour probing activities. As Lindblom says: 'One presumes that suppression of information or deliberate misrepresentation obstructs inquiry. But they do not always do so; or, alternatively, they do not always make a bad situation worse and may on some accounts improve it' (Lindblom 1990: 63).

The knowledge that comes into play in planning and policy processes is therefore stratified, made of layers differing in genesis and intentions, overdetermined by belonging to very different discursive regimes. Moreover, as Lindblom points out in *Inquiry and Change*, knowledge is always 'compromised'.

An important part of *Inquiry and Change* is dedicated to the issue of impairment. On the one hand, Lindblom points out that over time the abilities of all actors (experts and non-experts) to effectively exercise their testing strategies

have grown. On the other hand, limits continually emerge with respect to the cognitive skills of actors. In other words, in addition to the fact that we do not know enough about the social problems we would like to address, there are also obstacles of various kinds to the full manifestation of our ability to exercise probing.

These obstacles are defined by Lindblom as forms of impairment, and dependent on individual but above all social factors. He actually speaks of 'impairment as socially caused defects in probing' (Lindblom 1990: 61). Actors can be illogical, irrational, influenced by opinions that have been ideologically conveyed or even instilled by other actors. Some ideas can be censored and others can be deliberately excluded from the list of possibilities. To give an example, after the pandemic, we cannot fail to think about the way in which the European Union has restored viability to a series of ideas and proposals for exiting the crisis, starting with the programming of public investments financed by debt: an approach that after the terrible global economic crisis that began in 2008 was considered simply unthinkable.

On the other hand, as Lindblom points out, there is no sure way to free yourself from the various forms of impairment. First, because 'the many ways in which people can impair each other's probing are so varied, so numerous, so complex – and so subject to alternative interpretations – as to escape satisfactory classifications' (Lindblom 1990: 66). Precisely because powers and knowledge are inextricably intertwined, the compromise of the knowledge mobilised is an integral part of the social interaction process implemented in probing.

However, we must understand the reasons why the impairment, which in some respects cannot be eliminated, could also be considered a resource for action. I believe that the central issue is connected to the conception of action that underlies Lindblom's reasoning: action is always social, it is a joint interaction that depends on exchanges, interactions, conflicts and compromises between the actors. 'Joint' does not mean 'convergent' at all: it means that probing is a social process in which many discourses inhabit the same space, mix and translate each other. In many situations, this translation is also based on misunderstanding, on the possibility of jointly establishing a reason for what happens, even in the presence of significant cognitive dissonances and conflicts of interpretation.

Of course, according to Lindblom, if the impairment is explicitly produced for the purpose of veiling or concealing relevant information from some social or professional group, or even from some elite, then it must be strongly opposed, especially where its consequence is the exclusion of some subjects from the probing process. In Chapter 6 of *Inquiry and Change*, entitled 'Elite and Other Advantaged Sources of Impairing Influences', Lindblom discusses possible remedies to asymmetries in access, and above all in the possibility for

cognitive resources to be used by citizens (and, I would add, disadvantaged groups). In many passages, Lindblom seems to underestimate the conflictual and power dimension of impairment phenomena, for example when he states that the competition of ideas can offer some tools to guarantee greater opportunities for probing and testing practices. However, the American scholar always appears fully aware not only of the ambiguous and unavoidable nature of impairing, but also of the importance of making opportunities and devices available that can enrich the social process of treating public problems.

The theory of probing and impairment implicitly assumes the work done by Lindblom and Cohen (1979) in *Usable Knowledge*. In the book, the two authors show how the interaction between knowledge and action works in social problem-solving practices, focusing on the fact that relevant knowledge is produced by a multiplicity of actors, is processual, and has different characteristics.

With respect to planning and policy-making, each of these traits has exceptional relevance. First, we are inclined to believe that relevant knowledge is that produced by experts. Second, the relevant knowledge is assumed to be prior to the design process (knowing to decide, survey before planning) and policy implementation. Of course, more and more often, also thanks to Lindblom, the persuasion has emerged in the social sciences that during the process relevant knowledge is produced. However, the representation of knowledge as control mechanisms (monitoring, evaluation) remains dominant with respect to the expected and predictable trend of planned interventions.

Finally, it seems obvious that knowledge produced by experts, as relevant knowledge, is of a technical nature and is in any case attributable to the field of expert knowledge. Common knowledge, with its sometimes imprecise, often uncontrolled speeches, is considered a noise that should be silenced.

In the planning theory literature, as well as in various disciplinary fields closest to the operational practices of design, programming and planning of public policies and interventions, much has been written to criticise and suspend the implicit assumptions of the technocratic model of the connection between knowledge, action and control. However, in concrete programming and planning practices, Lindblom's lessons have been largely disregarded, and there has been a return to technocratic models and trust in expert knowledge as the only elements capable of effective treatment of public problems which, in many respects, has never abandoned operational programming and planning practices, for example in the context of post-COVID-19 programming.

What do Lindblom and Cohen teach about knowledge in social problem-solving action? What can we learn about the role of common knowledge in a depoliticisation strategy for antifragile territories?

First, they emphasise that social scientists, and experts in general, overestimate the role and effectiveness of those practices that they collect under the

name of professional social inquiry. At the same time, the role and relevance of ordinary or common knowledge is largely underestimated. Lindblom and Cohen wrote:

> By 'ordinary knowledge' we mean knowledge that does not owe its origin, testing, degree of verification, truth status or currency to distinctive PSI (professional social inquiry) professionalism, but rather to common sense, casual empiricism, or thoughtful speculation and analysis. It is highly fallible knowledge, but we should call it knowledge even when it is false … For social problem solving, we suggest, people will always depend on ordinary knowledge ... The most basic knowledge we use in social problem solving is ordinary. (Lindblom and Cohen 1979: 12–13)

Ordinary knowledge is based on a multiplicity of spurious sources, it does not meet the criteria proper to scientific knowledge, and it presents traits of ambiguity and volatility. Basically, it is made up of discourses which are produced in the processes of social interaction. Common speeches are not delivered only by ordinary people: they also characterise the ordinary practices of experts' life when they interact with each other and with other actors. The sphere and atmosphere of speeches are always necessarily inhabited in the first instance by ordinary knowledge.

Ordinary knowledge is knowledge produced through common discourses that take place in social and situated interactions between conflicting actors. This knowledge plays a central role in all phases of policy, planning and programming processes, including the initial one in which the problems are defined: 'All of the attempts to define the or a problem, none is correct (or incorrect) … We do not discover a problem "out there": we make a choice about how we want to formulate a problem' (Lindblom and Cohen 1979: 50). In this formulation process, expert knowledge is always inextricably intertwined with common discourse, with values, passions, interests, with politics and power.

Common knowledge, however, intervenes not only in the problem-setting phase but also in the identification of possible solutions, as it is able to account for the effectiveness of actions with respect to everyday life. Lindblom has called this mode of action 'interactive problem-solving', as opposed to the analytical model. To practise interactive problem-solving we need ordinary language, because only through a complex process of mutual adjustments, misunderstandings and partial agreements, can solutions be defined that have the character of (at least partial and temporary) sharing.

Lindblom and Cohen have understood that problem-solving based on social interaction and common language is an ideal type. In reality, analytical and interactive approaches are always mixed, just as expert knowledge (and that produced by experts) ends up being assumed in common discourses, whereas ordinary knowledge can be implicitly or explicitly translated into the lan-

guages of technology. The assemblages between expert and common knowledge, and between analytical and interactive practices, are always local and specific. What matters is knowing how to recognise the hybrid and ambiguous nature of these assemblages, that is, the way in which each practice (linguistic and non-linguistic) subsumes and embodies others within its own horizon of meaning, thus re-defining their potential effects.

Why did I decide to use the concept of common and usable knowledge proposed by Lindblom with reference to the theme of antifragile planning? The reason is that antifragile planning must be removed from the risks of depoliticisation. As highlighted by the political ecology approach, it is indeed a question of re-politicising the notions of antifragility and preparedness. To do this, it is necessary to assume the centrality of common language and discourse in the political construction of problems and solutions to be tested in fragile territories, through an approach that imagines policies and projects as the outcome of a political process of mutual adjustment. The care of common discourses and the enhancement of social probing processes are two essential conditions for an antifragile form of planning that escapes the risk of the presumed neutrality of technical knowledge.

3.6 CONCLUSIONS

The main conclusions of this chapter are the following. First of all, an antifragile approach to issues of territorial fragility must recognise the need to deal with powers and conflicts. An antifragile strategy is a political strategy, which redistributes powers and resources and brings about a radical change in the development model.

Second, in a perspective of radicalisation of the political ecology approach, preparedness policies and antifragile strategies cannot be understood as individual choices and orientations: they presuppose collective action and robust public intervention.

Third, this approach implies a work of deconstruction of discourses, in which the technicalisation and naturalisation of problems and solutions connected to territorial fragility are at work. The care of discourses is the first step to giving space to politics in the definition of policies, strategies and programmes for fragile territories.

Fourth, the work on discourses, on the link between powers and knowledge, on the 'invisible power' that animates technical languages, requires a resumption of attention to common language. Common language, in the meaning of Charles Lindblom, is the essential tool of social probing.

Finally, Lindblom's approach, appropriately radicalised, shows the potential of common language as a place of conflictual social interaction, that is, as

a field for experimenting with antifragility policies and strategies that take on the political nature of the various forms of fragility.

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PART II

Models and paradigm shifts in an antifragile perspective

4. Planning for the unseen[1]

Alessandro Balducci

4.1 INTRODUCTION

Those who study urban phenomena have known for a long time that many changes are almost imperceptible, in the sense that the impact they have on the space, and on the ways in which the city and the territory function, is observed a long time after the relative innovations and changes first emerged.

In a recent seminar, Saskia Sassen said that, with regard to cities, we are going through an era-defining change in which we intuit certain aspects that are hard to see; we perceive them, they appear from time to time, but we are not able to understand them. We need to dig down to understand them. Little is changed from the outside, but a lot has changed inside. This is the meaning behind this chapter's title, 'Planning for the unseen'. With regard to the cumulative effect of less visible transformations, I would like to understand what we can do to try to guide the urban and territorial transformation processes, rather than simply be subject to them.

Sassen always maintained that one of the aspects of this momentous change is, for example, the harshness with which processes of exclusion take place in American society. But I was particularly struck by one point that she added to these considerations. She maintained that the brutality of certain processes by which people and the environment are exploited has to do with the enormous distances that are possible in the United States. Territories and cities are exploited and then abandoned, the rich do not see how the poor live and so they are able to ignore them. She believes that such distancing is not possible in Europe, which has a much longer history and has developed a greater ability to take care of those in difficulty.

If this issue of physical and visual distance is so significant, perhaps it should be added that the explosion of everything that the internet has allowed

[1] This chapter is based on a keynote speech held on 22 November 2022 at the Final Conference of the 'Fragilità Territoriali' Project (DAStU, Politecnico di Milano).

us to achieve has had a distancing effect (even in physical proximity to one another), which multiplies our ability to ignore those in vulnerable conditions.

One aspect of our difficulty in understanding is therefore represented by phenomena that we cannot see, partly because they are underground and partly because they are intentionally hidden. The overall result is the crisis in our ability to understand, which also leads to the paralysis of our ability to take action.

In *Réveillons-nous*, Edgar Morin speaks of the invisibility of the crisis of thought. He writes that at a deeper level, the invisibility of the crisis of thought depends on the separation and fragmentation of knowledge, the reunification of which is considered impossible and that our blindness to the current crisis is due to ignorance of the hidden work going on under the surface of the present (Morin 2022).

We must therefore try to understand how underground, unseen or intentionally ignored phenomena as a whole change the picture that we have in front of us. In this regard, the Covid-19 pandemic has allowed us to look at a series of phenomena from the outside and forced us to open our eyes. It is only by looking at what we do not see that we will be able to effectively deal with the issue of fragility.

This chapter is structured as follows: first, I provide a brief overview of invisible, unseen or barely visible phenomena, trying to highlight some of the fragility-exacerbating effects that each phenomenon generates; next, I attempt to clarify the relationship between fragility and politics; I then try to identify some ways out of this crisis.

4.2 THE THINGS THAT WE DO NOT SEE

In this section, I list and briefly discuss a series of pressing and disparate issues related to what I define as 'unseen' processes and phenomena. Many of the transformations under way are related to digitalisation, a phenomenon that is typically not very visible, but has penetrated all areas of our social organisation, production, work, consumption, education, tourism, services and health. There have been profound transformations in the operational, decision-making and governance processes in every sector. Digitalisation offers great opportunities, but also generates new exclusionary processes between areas served and not served by an efficient network, between those who know how to code and those who are barely digitally literate, between those who benefit from the new opportunities and those who are penalised by them.

E-commerce is progressively replacing traditional commerce and even some major distribution operations. And this replacement has happened over time. The phenomenon has still not fully materialised, and it seems that with the pandemic the percentage of commerce done electronically increased from 7 per

cent to 9 per cent in Italy, while the figure now stands at 28 per cent in England and 44 per cent in China (Osservatori.net Digital Innovation). When Amazon started doing business it was an online bookshop that also sold second-hand items; it would have been hard to predict that it would become the global giant that it is today.

The penalisation of in-person shopping undermines urbanity and urban vitality in many areas. What we see, in our physical space, is closures, accompanied by the emergence of lockers for collecting packages, trucks driving around all day, including Sundays, urban logistics centres in cities, and large-scale logistics centres in proximity to motorways. In addition to the spatial impacts on the urban scenery, there are significant social effects. In Italy, commerce has made a major contribution to employment, but that employment is now being lost and it is difficult to know the extent to which it can be replaced. The entire platform-based sector of the economy was developed at an extraordinary pace over the last 20 years.

Airbnb started as an opportunity to exchange apartments between people who could gauge each other's reliability. Nothing changed in physical space, but it gradually became the largest property company on the planet. The effect on the housing market was considerable. In cities of culture and large attractive cities especially, it created a new business that was accessible to many people, but also contributed to the expulsion of a medium- to low-income population (Ferreri and Sanyal 2018). There are entire parts of cities that have been bought by investors just for short-term rentals, which also has a negative impact on the hotel sector. This is a further crisis factor affecting an economic sector and the related job market. The pandemic then suddenly froze this huge market, although it is rapidly recovering.

Vehicle sharing has started slowly, in experimental form, and has progressively established itself in cities, having the positive impact of reducing the number of motor vehicles owned by families, but also generating a disparity between major dense cities which offer all kinds of public transport and every imaginable form of vehicle sharing, from cars to scooters, and outside the cities, the countryside and low-density areas, where such services are extremely limited or non-existent (Vinci 2023; Cohen and Shaheen 2018).

Even social media platforms such as Facebook, Instagram, Twitter and Telegram have been subject to extraordinary development and made it possible to cancel out many of the effects of distance. They have certainly made it possible to create communities of physically distant individuals (brought together by their passions and interests: anti-vaccination opinions, 'white dinners', rave parties, and so on), but they have also weakened many ties inherent to the relationship between individuals and their communities. This has generated fragility not only among people who do not have access to social media (primarily the elderly), but also among the teenagers who were forced to

isolate during the pandemic and were not able to escape the bubble of merely virtual relationships.

The spike in activities that we have had to carry out remotely due to the pandemic has also opened up interesting opportunities in the sense of a better distribution of activities between central areas and peripheral areas. If variation between activities carried out in-person and remote activities is maintained, it will be possible to truly expand the city's reach, including the suburban and peripheral areas of urban regions which, thanks to the presence of home workers, will no longer be just residential neighbourhoods. With the presence of people who will, for a significant amount of time, be liberated from the costs and time inherent to commuting – short- or long-distance – and will therefore also be able to seek out opportunities to invest their time in the communities in which they reside (Balducci 2022), significant efforts can be developed in order to repopulate the metropolitan periphery in new ways. This is an opportunity which, at the moment, some large companies are looking at on an individual basis, but which has not yet become regional public strategy.

Let us consider now the issue of financialisation, which has impacted upon the entire global economy. Much has been written on the revolution that it has created in what was the building of value in the original capitalist system (Mazzuccato 2018). Sovereign funds invest in major cities, treating properties like financial assets regardless of whether they are used, producing an increasing amount of assets that are sold but not used, drugging a construction market that has become detached from real demand at the expense of affordability. Moreover, looking at the Italian territory, the so-called 'social housing' which seemed to be able to replace public investment in social building – the only type able to make an impact on housing exclusion (Bricocoli 2017) – did not meet its promises.

Infrastructure too has been subject to profound material and immaterial transformation processes (Azzone et al. 2020). The digitalisation of traditional infrastructure has multiplied its efficiency (from the management of rail and metropolitan lines, to water and waste management). These are processes that have transformed infrastructure and its operators into hoarders of knowledge and decision-making powers once in the hands of local administrations, with a growing number of accountability problems. The high-speed train line advertised as 'Italy's metro' (*metropolitana d'Italia*) enrich the major centres that it serves and impoverish the areas that it crosses but does not serve.

Another point to be stressed is climate change. Environmental degradation problems are silent and progressive problems that are hard to see, but they affect the inhabitability of cities and territories (Latour 2017). Extreme rainfall, heatwaves, air, water and soil pollution, and rising sea levels, are phenomena which have become increasingly important and have significant consequences for the economy and the need to reorganise space. Authoritative

studies support the idea that there are connections between climate change and the pandemic. Moreover, there is growing awareness of its links to the problems of migration from the South of the world towards the North. In addition, some mountain and coastal areas, which were already fragile for geomorphological reasons, are more exposed to risks related to climate change. The same could be said about some industrial areas at high risk of environmental crisis.

As stated before, the pandemic has offered further elements of reflection on the things we do not see. Public health problems exploded with the pandemic. It has been debated whether it was density that encouraged the virus to spread. It has been observed that it is not so much density per se that was responsible for the spread, as much as density combined with situations of economic and social deprivation: small homes, difficulty in accessing open spaces, forced contact on overcrowded public transport, and so on (AbouKorin et al. 2021). Large cities have attracted major hospital centres thanks to the progressive specialisation of medicine, while small and medium-sized regional hospitals have closed. Health policy more generally has gradually abandoned regional medicine, making hospitals the centre of the entire system, which produced dramatic and well-documented effects during the pandemic.

The pandemic also in many ways highlighted the existence of a mass of people who carry out work that is essential for the functioning of the city; workers who are often invisible and who, in common perception, are considered to occupy lower rungs on the social ladder: carers, cleaners and rubbish collectors, nurses, and the couriers who deliver food and all kinds of other goods to our homes. This population is not only generally underpaid, but also often excluded from the housing market in cities. In this regard, Perulli and Vettoretto (2022) discuss the creation of a new proletariat.

It is worth noting that while population ageing is a highly debated issue, its impact is still not fully understood in terms of its extent and nature (Buffel and Phillipson 2016). This is so because being old today is a very different experience compared to the past. Nowadays a significant number of elderly people form a fragile and fearful population due to social insecurity, limited ability to use digital tools, and discomfort with the reduction of neighbourhood services and commercial activities. In addition to this, it should be noted that social welfare policies rely on care and residential models that are now outdated. Visible, but little perceived as an urban and social phenomenon, is the abandonment of obsolete buildings in shrinking territories due to rapid economic transformations. In Italy, in recent years there has been an extensive discussion about inner and marginal areas, with an emphasis on the so-called resentment and ‘revenge of the places that don’t matter’ (Rodriguez-Pose 2018). Furthermore, during the pandemic phase, there has been a lot of discussion about a ‘return’ to these places as a reaction to the emergency, but also as an opportunity to rethink a more balanced settlement model. E-commerce,

social media, and all means of accessing goods and information via the internet have been quite efficient, but they have not replaced other forms of cultural and social exclusion.

In this context, the nature of peripheral spaces undergoes a transformation both within and outside the city (Petrillo 2021). The condition of urban peripheries is multifaceted: they are no longer just the outermost areas of the city, but instead extend to different parts of large urban regions. Regardless of their location, peripheries are often characterised by high population density, mono-functionality, limited access to services, and concentrations of people suffering from various forms of exclusion and poverty. However, while the original essence of peripheries is rooted in accessibility and affordability of housing, in cities such as Milan where urban valorisation is a steady process, even urban regeneration initiatives often lead to gentrification.

Another somewhat paradoxical aspect concerns the relationship between land consumption and demographic trends. Urbanised areas have extended throughout the territory, with constant growth in land take despite the stability or concentration of the population. This phenomenon goes largely unnoticed (Balducci et al. 2017). The systems according to which cities are governed, rooted in obsolete borders, make it very difficult to interpret such a profound change. This is so because the organisation of power among local institutions is fragmented and dysfunctional, but also because the decision-makers are often not public (for example, rail and infrastructure operators).

Finally, there are certain aspects that are often overlooked or not given enough attention, such as the grassroots movements that come together to address the inequalities resulting from the aforementioned processes. Active citizenship, self-organisation and community-led response to the needs of their members (Balducci 2019) serve as valuable resources. Even without a direct line of communication with institutions, these movements often leverage their networks to form alliances to take on various roles such as establishing cultural centres, managing public spaces, renovating abandoned buildings, or creating affordable housing and co-working spaces.

4.3 THE RELATIONSHIP BETWEEN FRAGILITY AND POLICY

Looking at the combination of these transformation processes, the elements they have in common are: (1) exponential growth in complexity, also linked to the low visibility of the phenomena; (2) the tardiness of politics and policies in dealing with the adverse effects that are generated, as a result of the growing complexity; and (3) an overall effect of increasing inequality and exclusionary processes. In this regard, the combination of these separate and partial processes, unfolding at different speeds, is responsible for the creation of various

forms of territorial fragility that are directly related to the policies' inability to track the deep redistribution processes that are taking place in society. Observing them in terms of their relationship with public action or non-action, the emergence of different forms of fragility appears to be anything but a 'natural' phenomenon; rather, it is the consequence of weak public policies and the pursuit of political processes created under a veil of ignorance that has systematically hidden their redistributive nature, presenting every decision as if it were inspired by merely distributive principles. I am referring to a distinction made by Theodore Lowi (1972) in the field of political science: distributive policies are characterised by the fact that the government's decisions can be taken without concern for the scarcity of the available resources, or their disaggregated or specific nature; redistributive policies concern the allocation of resources among major categories of individuals and classes, and they are aggregated by definition.

In an attempt to better characterise Lowi's distinction, James Wilson (1973) highlights another dimension that helps to define the two major categories of policy: namely the concentrated or distributed nature of the costs and benefits. In distributive policies, the benefits are concentrated and the costs are distributed; whereas in redistributive policies both the costs and the benefits are concentrated. Consequently, it is predominantly the beneficiaries who mobilise in favour of distributive policies in order to obtain advantages, while those who pay the costs of those choices do not mobilise, because they do not perceive the burden that they take on, through general taxation, for example, or the taking of other types of resources from the population in general. These policies are therefore easier to adopt, less visible, and give rise to so-called 'logrolling' (Lowi 1972), or the trading of support for policies between the beneficiary communities, involving several issues (support for high-speed rail in exchange for support for the privatisation of motorways, and so on). Conversely, redistributive policies have concentrated costs, and their benefits, which are also concentrated, trigger organisational conflicts and require the politicisation of issues, pushing the decision-making towards the top; they require the distribution of costs and benefits to be dealt with transparently; they require the building of difficult compromises.

Falsely distributive policies, or the absence of such policies, has encouraged the creation of areas of growing fragility, precisely because collective resources have been redistributed to few beneficiaries. Let us consider the following critical issues:

- The deregulation of the digital economy has allowed the giants of e-commerce, or the platform economy, to build fortunes, paid for by economic contraction and a decline in employment in many sectors (Srnicek 2017).

- The shift towards financialisation, which is also subject to little regulation due to its extraordinary complexity (Mazzuccato 2018), has brought about a clear separation between what can generate profit and what is devoid of speculative interest: the peripheries and marginal territories.
- The natural environment was and continues to be perfect terrain for the appropriation of resources by groups and nations to the detriment of (future) generations, nations and populations who are having fundamental resources taken away from them (Latour 2017, 2018).
- The concentration of public investment in big cities (linked by high-speed rail, the sites of major events or new infrastructure projects), has taken resources away from other destinations (commuter transport, essential infrastructure in areas in crisis, schools, hospitals, transport).
- The reduction of the urban design of cities to what can be captured as value by private investment has transferred planning responsibility and power from the public to a few private individuals capable of conducting complex operations.
- The procurement of service provision and infrastructure operation has redistributed public-sphere powers of governance from the community to a limited number of private individuals (Amin and Thrift 2016).

Fragility therefore has a lot to do with deregulation and the continual reiteration of policies which favour strong areas, leading sectors, presented – thanks to the complexity of the framework and the low visibility of many phenomena – as distributive policies for which there are unlimited resources. In reality, these are decisions, or non-decisions, that have taken resources away from weak sectors, territories and populations, and affect the environment, services or investments without ever accounting for how the costs and benefits are distributed among various social groups.

Not only are there opposing interest groups, but there is also an intergenerational conflict. The too timid and ineffective policies on emissions control, presented as resulting from the need to be 'realistic', have only taken environmental resources away from the generations to come, without taking on the responsibility of revealing the redistribution of chances of survival that is taking place from one generation to another. The resources of the natural environment, which we have discovered to be finite and non-reproducible, were treated as objects to be appropriated by the current generations to the detriment of future generations.

The cutting off of the underused lines among Italian State Railways's network has cancelled the right to mobility in many areas to make huge investments in high-speed rail which have mainly favoured the major urban hubs. Many policies to rationalise services – schools, hospitals, infrastructure – have had the same characteristic.

Unveiling the intrinsically redistributive nature of the policies that have produced and continue to produce fragility means recognising the need to repoliticise issues which, under the misleading guise of being merely distributive, have been depoliticised (Swyngedouw 2023).

Fragility is the sign of a deep crisis that impacts on territories, society, the economy and the environment. The financial crisis of 2008–2012, the pandemic of 2020–2022, the environmental crisis, and now the war that Russia started with the invasion of Ukraine, have dramatically signalled the crisis affecting this model, based on globalisation and financialisation, which had guaranteed prosperity for some people and the illusion of being able to participate in the growth for others.

4.4 THE WAY OUT

The convergence of all these elements of crisis signals the need for a new thinking, as suggested by Edgar Morin (2022). Bruno Latour (2018), in his enlightening essay *Down to Earth: Politics in the New Climatic Regime*, indicates a possible way out. It is the rediscovery of the 'terrestrial' nature of our link with places on the one hand, and with the entire ecosystem on the other. The 'territory' is the place where a new relationship between territorial rootedness and planetary dynamics is rebuilt, between care for one's own living environment and awareness of its ecosystemic connections. A relationship that is counterposed with the dichotomy between localism as enclosure within a space, and unfettered globalism which, according to Latour, has characterised the phase that has just passed and opened up the movement towards growing inequality, fear and selfishness. Latour speaks of precisely that contraposition between two axes: the regressive and self-destructive one that connects hyperlocalism (represented well by President Trump's 'America First' slogan in all of its local declinations) and total confidence in hyperglobalisation (which generates inequality, polarisation, disparities), and a progressive axis between territorial rootedness (return to the Earth) and knowledge of the relationships that each place has with the global ecosystem.

Similarly, Jeremy Rifkin (2022) speaks of bioregions as spaces in which to rebuild the relationships between populations, territories and the environment. It is a topic that has been covered for some time in Italy, by Alberto Magnaghi's Territorialist School (Magnaghi 2020).

Following Latour, we can look at hyperlocalism and hyperglobalisation as two faces of the same redistributive aproach. Absolute localism (Sernini 1988) does not concern itself with the effects on the environment or future generations, in defence of individual interests. The policy stance of America First withdraws from environmental protocols, reduces tax on those belonging to the 1 per cent who possess 90 per cent of the country's wealth, builds walls

against immigration, does not worry about the increase in public debt, as long as it can protect the citizens of today. Its aim is to concentrate the benefits and mobilise groups that may benefit from it, disregarding the costs that will have to be paid in environmental terms, or with growing inequality and the indebtedness of future generations.

But hyperglobalisation is also a desperate hunt for the best opportunities to exploit natural resources and employment; progressively shifting from the richer countries towards those offering the best conditions for exploitation – first to China, then to Vietnam, then Bangladesh – as if there were always a frontier to conquer and no one would have to pay the costs of this progressive shift (Harvey 2006).

In reality, the impoverishment of abandoned territories, the hyperexploitation of underpaid labour, the disinterest in searching for sustainable energy and environmental strategies in favour of new exploration of traditional sources, land-grabbing, the consequent migratory drivers, and the spreading of the pandemic related to hypermobility, are the costs that humanity is forced to pay to support that model, developed at haste over the last 30 years.

Exploring territories and their relationships with the global ecosystem of the new axis identified by Bruno Latour would seem to require moving in two directions at once: bottom-up and top-down.

The former requires the repoliticisation of the question of fragility, denouncing the redistributive nature of policies, and this can only be done by looking up, from above, taking up the great issue of inequality between social groups, territories and individuals as an issue that can only be dealt with by revealing the unfairly unequal nature of the policy. It is only at that level that selective policies can be established in order to support territories or populations in difficulty, and redistribute resources in favour of those who up until now have been penalised by the falsely distributive nature of the policies in place.

The Inequality and Diversity Forum (Forum Disuguaglianze e Diversità), organised by Fabrizio Barca (2019), has been tirelessly working on this issue for years. Its ultimate goal is to see the critical issue of redistributing national resources added to the government's agenda. Achieving this requires us to take a deep dive and examine the resilience of local societies, the innovative ways in which territories are being rediscovered, and the unique values that each territory brings to the table. The forum recognises the multitude of initiatives for resistance and resilience that originate from the bottom up, specifically in the peripheries and fragile territories. The capacity for self-organisation is crucial for individuals and resources to mobilise and achieve their full potential. However, this potential can only be fully realised with recognition of the innovative paths that can be taken; these paths can spark the regeneration of territories and trigger new processes of development. At the top, there is

a responsibility to recognise and define the strategy; while at the bottom, action is required. Neither of these dimensions can exist without the other.

Peter Galison, the philosopher and historian, author of the Trading Zone concept (Balducci and Mantysalo 2013), in a book on the glorious late 1800s period when scientists and politicians were committed to coordinating time and measurements, concludes his treatise by saying that:

> over the last 30 years it has become a commonplace to pit bottom-up against top-down explanations. Neither will do in accounting for time. A medieval saying aimed at capturing the links between alchemy and astronomy put it this way: In looking down, we see up; in looking up, we see down. That vision of knowledge serves us well. (Galison 2003: 304)

It is at this point that I want to start my conclusion. The disciplines of design, architecture and urban planning have been upended by bottom-up movements that have changed economics and society, and ended up being companions on a pathway ultimately leading to fragility. This was partly due to a preoccupation with formalism in architecture and a heavy reliance on private enterprise in urban planning, but also stemmed from a failure to address through planning the key issues related to environmental and spatial justice. The resulting fragility of our territories and institutions underscores the urgent need for more integrated and equitable approaches to design and planning.

Our Department's project on "fragile territories", by focusing on the core issue of fragility, analysed from very different perspectives, has had the merit of taking on the entire combination of transformations underway – for the most part invisible – starting from their effects. In doing so we have been able to discover the phenomenology of fragility in rural areas, in various kinds of peripheries, in areas subject to population decline, in the wounded landscapes of coastal and mountain areas, and to identify actions to mitigate problems and some possible ways out to escape from fragility.

As we reach the end of our five-year project, it becomes clear that the fields of architecture, urban design and planning have an even greater responsibility to address the current crisis. The focus must shift towards promoting the rediscovery of space, Earth, and ecosystemic links. This can be achieved – recovering the utopian and democratic roots of planning and urban design – through top-down approaches that prioritise brave territorial strategies as access keys to development, and working towards improving community living standards. Equally important are bottom-up approaches that support local resistance and resilience initiatives, providing quality design and connecting them within a daring spatial strategy. By doing so, individual innovative processes can be transformed into larger transformative processes.

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5. Urban policy design for antifragility

Ivan Blečić and Arnaldo Cecchini

5.1 DEFINING ANTIFRAGILITY

Antifragility (Taleb 2012) is best understood in contrast to three other properties: fragility, robustness and resilience. Things inhabit disorder. Be they inanimate objects, systems, organisms or institutions, perturbations and unpredictable events of all sorts happen to them, around them and within them. To determine whether something is fragile, robust, resilient or antifragile means to examine how it responds and reacts to such perturbations.

Something is fragile if it is prone to only harm over time. Events, stressors, volatility can only damage, break or destroy, and never benefit it. Not every event needs to be harmful. Rather, the above definition of fragility states two conditions which simultaneously need to hold: that there exists the possibility of only harm, and no gain from perturbations.

Instead, something robust withstands perturbations unaffected; while something resilient is capable to absorb and recover from perturbations, to bouncing back to its original state or to its functional equivalent.

Finally, antifragility is the proper opposite of fragility: something is antifragile when it can actually benefit from events, stressors and volatility: it can gain, get stronger, improve, evolve, better adapt. Analogous to fragility, not all perturbations need to be beneficial; some, perhaps most, may be inconsequential, but some can be – unlike in fragility robustness and resilience. Hence, antifragility goes beyond robustness and resilience since resilient or robust systems are merely perturbation-resistant, while antifragile systems not only withstand stress but can also benefit from it.

We can view these four properties arranged on the harm–gain continuum, from fragility to robustness, resilience, and finally antifragility. This allows us to pinpoint the definitional distinction between resilience and antifragility: while both are responsive to perturbations, what sets them apart is the potential for gain from these perturbations, that is, none in resilience, some and possibly large in antifragility. Consequently, resilience should be seen as a 'limit case' of antifragility. Strictly, an urban (sub)system should be said to be resilient if it is capable of absorbing shocks, perturbations, volatility, to recover and

bounce back to its prior equilibrium or to its functional equivalent. With this we are deliberately narrowing the definition of resilience from a more extensive meaning often encountered in planning literature, as we have suggested (Blečić and Cecchini 2016, 2020a) that those extensive meanings of resilience should, for both terminological and substantive reasons, rather be framed as antifragility.

Moreover, for each of the four properties we can talk about degrees to which they are applicable. For instance, when attributing the property of robustness or resilience to something, it is such only up to a certain intensity of perturbation, beyond which it breaks, loses function or the capability to recover.

In the domain of urban policies and planning, we must account for the 'redoubled complexity' of urban systems: they are complex in the 'simple' mechanical sense of large 'many-body systems' (Anderson 1972) interacting in a non-linear fashion, but are additionally complex due to them also being social systems, with some components being autonomous social agents (Hillier 2012; Portugali 2000, 2012). If not ultimately ontological, this autonomy can only be taken as an epistemic, ethical and – for all practical purposes – an operational assumption.

Nassim N. Taleb is also known for developing the concept of Black Swans (Taleb 2010): large-scale, unpredictable (from the observer's point of view) events of large magnitude and consequences. The Black Swans that Taleb discusses often occur within systems with the aforesaid redoubled complexity, along the nexus of social–political–ecological–natural systems,[1] even if a purely physical non-social phenomenon, under certain conditions and always from the perspective of a given observer, can be considered a Black Swan. While there may be formal tools to identify whether a Swan event was actually 'black', 'grey' or 'white' (e.g. De Marzo et al. 2022), we can identify a special subclass of Black Swans which, in tribute to a former United States President, we shall call Orange Swans. To pursue with the example at hand, can Donald Trump's victory in the 2016 presidential election be fully assimilated to Black Swans such as World War I, or the success of the Internet, or the 2011 Tōhoku tsunami which provoked the Fukushima nuclear disaster? While these events may be outcomes of a combination of complex natural deterministic processes (complexity 1) and the fruits of agents' actions (complexity 2), the case of Trump's presidency arguably stands out for the eminently social snowballing ignited by an exceptional unpredictable individual action.[2]

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[1] Among examples of Black Swans, Taleb includes the rise of the Internet, World War I, the dissolution of the Soviet Union, and the 9/11 attacks.

[2] Let us clarify three points on what we see as the peculiarities of Orange Swans. First, Orange Swans are not to be equated in general with exceptional features and deeds of individuals. Lionel Messi in football (as De Marzo et al. 2022 have suggested),

Having outlined these general definitions, in this chapter we want to elaborate more in detail on the relevance and operational applicability of the concept

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and eventually Magnus Carlsen's attaining a 2900 FIDE chess rating, would both fall into the Black Swan category (if these occurrences had a larger societal impact). However, they can still be interpreted as phenomena belonging to the world of what Warren Weaver would call 'disorganised complexity' (Weaver 1948), as rare extreme occurrences of fat-tailed stochastic processes (generating football and chess players). Instead, the entire Trump effect was possible within the world of 'organised complexity' with the predominant role of social processes, whose structuring and evolution was put in motion by the singularity of Trump's candidacy. Trump happened to us because he decided to run for the presidency, which set into motion the build-up of social and political processes making enough people choose to vote for him and, perhaps to Trump's own surprise, to make him President, with all the ensuing consequences.

While one could doubt the larger societal impacts of exceptional football or chess players, sometimes a Black Swan can turn into an Orange one. Perhaps one such instance comes from literature, in the classic proposition, 'If Shakespeare did not write *Troilus and Cressida*, someone else did'. On one level of reading, this proposition is undeniably true, in the obvious sense that since the play exists, someone must have written it. However, on another level, there certainly can be doubts that had Shakespeare not written *Troilus and Cressida*, someone else would have, because 'only the Bard …'. After all, we should not be entirely dismissive of Pascal's intuition that 'Cleopatra's nose, had it been shorter, the whole face of the world would have been different' (Pascal, *Pensées*, 1660).

The second point of clarification is that Orange Swans are not strictly equivalent to butterfly effects deriving from individual actions. For example, the Gore versus Bush 2000 presidential election was likely highly momentous for the geopolitical events of the following decade (arguably, the invasion of Iraq would have not happened under Gore's presidency), but Bush's electoral victory was not (and Gore's would not have been) unpredictable to the degree that Trump's was at the moment of his candidacy announcement. Hence, Gore versus Bush likely had a butterfly effect, but was not an Orange Swan. However, the line may sometimes be thin, or even non-existing. We could indeed come up with many well-known examples from history to illustrate the impact of singular events and individuals, since the problem of relationship between permanence and catastrophe is one of the most difficult theoretical nodes of historical interpretation.

Third, Orange Swans in principle need not to rely at all on the exceptionality of individual agents. The key feature of Orange Swans is the singularity of the evolutionary trajectory of social processes that produce the exceptional event. As an example, this would be the case of René Girard's hypothesis of the process of hominisation and the emergence of human culture ignited by the scapegoat mechanism (Girard 1977). In Girard's model, the scapegoat individuals, indeed, become 'exceptional' after being singled out as scapegoats, up to attaining divinisation, but are in principle picked randomly, their singling out being the eventual outcome of them becoming the focal point of 'deaf' mimetic social processes.

of antifragility for urban policy design and planning. Specifically, we want to discuss:

1. the normative question of what it would mean to elect antifragility as a public policy goal;
2. the operational question of how antifragility can be pursued in designing urban policies;
3. the example of the concept of the so-called '15-minutes city', to illustrate how the principles of antifragile design may provide insights and tools for its critical examination.

5.2 ANTIFRAGILITY AS PUBLIC POLICY GOAL FOR PLANNING

To elect antifragility as a public policy goal, the first question to address is directly related to the above definition of antifragility. In defining antifragility as the possibility of 'gains from disorder', the central controversial issue in public policy and planning becomes determining what should be the informational focus (Sen 2009) to define and quantify those 'gains', given the inevitable multitude and pluralism of individual and social actors who are the subject and object of, and affected by, public policy. It is one thing, although not necessarily straightforward, to define what may constitute a gain for an individual, an organisation or a well-defined group within society, but it is altogether a problem different in nature to define it at the level of entire society, that is, in relation to possible states of alternative complete descriptions of the society.

The problem of informational focus, with all the ensuing normative and descriptive questions (Who should gain what? At what level, individual or collective, should the gain show up? What gain should be measured? Who gains? At the expense of whom or of what? and so on), is of course inherent in any public policy, but it takes on an additional significance when targeting and promoting antifragility as a political goal. In fact, sometimes antifragility at the aggregate systemic or collective level may obtain at the expense of fragility at the local levels. In such cases, the system operates to benefit from such local fragility (exposition to harm) through some mechanisms, depending on the context, of adaptation, imitation or learning via local trial-and-error, tinkering, experimentations, failures, competition, survival of the fittest, or discovery.

One such possible operating of antifragility, of gains at the aggregate or collective level at the expense of local levels, or for some capitalising on the fragility of others, has sparked objections to the legitimacy of antifragility as

a political ideal (Kolers 2016).[3] Kolers is correct to raise the concern, since in social systems some of those local-level components are social groups and individuals whose fragility can be a legitimate concern of the state, and whose treatment, liberties, well-being and security are valuable goals, not unconditionally available to be fragilised for the sake of 'the greatest antifragility for the greatest number'.

But perhaps Kolers's assessment deserves a reconsideration, since the level-relative nature of antifragility does not, in our view, pose an insurmountable obstacle to the construction of a workable legitimisation. In general, political theory is not unfamiliar with dealing with level-relative concerns. Does not the two-tier structure of Rawls's principles of justice operate precisely with such concerns in mind, when individual liberties take priority over the difference principle? In planning theory, Moroni (2019) has argued that operating within such level-relative tensions is both possible and unavoidable.

Hence, rather than dismissing it altogether, the proper question would be to ask what kind of antifragility may be legitimately pursued. To paraphrase the question others have asked about resilience itself (Carpenter et al. 2001; Davoudi and Porter 2012), the point is to ask 'antifragility of what to what?' Our answer would be that the goal of antifragility should be pursued for valuable systems by endowing them with optionality and asymmetry of possible gains versus harms in the face of uncertainty, in order to increase the chances for them to evolve favourably. To construct a legitimisation for such antifragility as a public policy goal would require two normative stipulations: (1) the identification of the informational focus defining the publicly relevant dimensions of gain or benefit; and (2) the determination of possible constraints in regard to level-relative concerns, including the stipulation of acceptable trade-offs with potential local or individual fragility and, if necessary, the provision of adequate protective nets.

It is beyond the scope of this chapter to delve into such stipulations, except to refer the reader to one such possible framework developed elsewhere (see Blečić and Cecchini 2016, 2020a), employing the capability approach (Sen 2009).

The discussion so far allows us to clarify a necessary normative content of antifragility as a policy goal. In the strict sense, policy design for antifragility is devoid of, and does not imply, reference to any substantial normativity

[3] 'The citizens' affairs cannot *all* be anti-fragile, because in many cases the anti-fragility of some involves capitalizing on the fragility of others. And the state or community cannot *itself* be anti-fragile because part of its function is to absorb some of its citizens' fragility. As a state aim, anti-fragility is therefore illiberal' (Kolers 2016: 95).

(that is, deontology, theory of justice, political goals, and so on).[4] Rather, its normativity is operational, addressing the concerns of the Weberian ethics of responsibility for consequences and outcomes, from which in part the goal of antifragility derives its legitimacy. By assuming uncertainty realism in our domain, it tries to address the problem of expediency of action and policy, and to offer a conceptual framework with a set of tools, principles, heuristics and recommendations for policy and mechanism design.

In consequence, antifragility should be viewed as only a partial goal for urban policy and planning, with other components required to target any substantial normative goal pertaining to politico-ethical domains. In other words, the question of what makes a policy, a plan, a service, an institution, an urban system fragile or antifragile, is not the same as the question of what makes them good, just or right. Despite being two distinct questions, the minimal normative content of our proposal is that they should not be answered separately. Our central claim is that the two questions in planning, and in public policy in general, must be addressed concurrently in order for the answers we provide to be normatively and operationally compatible with one another.

In our view, many recent proposals, such as urban resilience (Davoudi et al. 2013; Davoudi and Porter 2012; Meerow et al. 2016), adaptive planning (Kato and Ahern 2008; Rauws 2017; Skrimizea et al. 2019), and our proposal of antifragile planning (Blečić and Cecchini 2016, 2020a), are attempts to organically address the kind of problems that uncertainty, and especially deep uncertainty (Moroni and Chiffi 2022), pose to public policy. Such problems fundamentally question what the normative content of planning may realistically be, given that the unpredictability of urban systems (Hillier 2012; Moroni 2015) brings about uncertainty of ultimate outcomes of policies and actions, raising both deontological and operational problems for planning (Chettiparamb 2019; De Roo and Hillier 2012; Innes and Booher. 2010; Moroni and Cozzolino 2019; Portugali 2006, 2008; Portugali et al. 2012). Hence, what these proposals have in common is to couple: (1) indications for action, policy and design which are inevitably projected towards future outcomes, even if the future may be hard to predict; together with (2) care for future collective outcomes.

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[4] This is so also because, in general, not only what is antifragile not inevitably 'good' or 'right' (whatever conception of 'good' and 'right' one may have), but also many 'bad' things are often antifragile, and the worst almost always are, precisely because they are antifragile: from the most anguished nightmares to the haunting literary inventions of horror (from the Hydra of Lerna, to the Borg in *Star Trek*, both of exemplary antifragility), from degenerative psychotic spirals to the most stubborn forms of addiction. One could appreciate the fact that the biological evolution of life is generally antifragile, but when directly affected one could be much less appreciative of the antifragility in adaptation of viruses, parasites and predators.

5.3 DESIGNING ANTIFRAGILITY

Pursuing the goal of antifragility in planning and urban policy as interventions on socio-ecosystems (Equihua et al. 2020) entails two families of principles. The first pertains to *primum non nocere*: other than what to do, antifragile planning should as much be about what to avoid doing, so as not to fragilise those systems. Elsewhere (Blečić and Cecchini 2020a) we have attempted to identify a set of attitudes and practices of intervening on social systems, and on urban systems in particular, which may fragilise them, namely: decisions based on fragile predictions; excess of centralisation-*cum*-micromanagement; fixation with efficiency and optimisation; specialisation; extractive political and economic institutions; and the crumbling of the 'cement of society'. Shunning such fragilisers constitutes a *prima facie* content of the *via negativa* in antifragile planning. However, under the tenet of *via negativa* there is also a place for policy options subject to democratic deliberation. The idea of *via negativa* does not imply a withdrawal into a planning miniarchism or the maintenance of the status quo, and does not exclude the possibility of even structural transitions and 'changes of regime', as long as they observe principles of generality, retract from short-term contingencies and conveniences, and do not introduce significant new sources of fragility.

The second family of principles, to which we dedicate more space in this chapter, pertains to operational heuristics for what may constitute the *via positiva* of antifragile planning and policy design. Before presenting these principles, the caveat is that their concrete applications of course depend on the specific policy subdomain. The great variety of what usually falls under the umbrella of urban and territorial policies and projects requires that we express the principles with a certain degree of generality, allowing, and demanding, their further specification for different policy reference classes. As we have said, ideally, they should provide a conceptual bridge between theory and practice. This also entails that the principles may not be pursued in all circumstances in the same way, by the same means, with the same intensity and rigour, nor can they be obtained to the same degree (building a bridge is not the same thing as devising a neighbourhood regeneration strategy).

5.3.1 Modular Design

We start with this principle as it represents the precondition for many of the following ones. Well known across engineering and industrial domains (Baldwin and Clark 2000; Brusoni et al. 2023), it suggests to identify the minimum viable functional unit which could be operational as soon as it is completed, and to devise the policy or the project as a partitioning into such

discrete scalable and possibly reusable modules. Such an approach is favoured if the circumstances allow the modules to be relatively functionally independent, and to use well-established and tested modular interfaces among them.

In the context of urban policies and projects, modular design favours learning and scalability (Flyvbjerg 2021; Flyvbjerg and Gardner 2023). Instead of going full-scale immediately, it ideally allows the incremental prototyping of a few modules, their experimental putting into function, and relatively rapid cycles of tinkering, learning and improvement over the next iterations and additions. Such an approach specifically favours antifragility, as it is more adaptable to changes of circumstances in the medium to long run. Indeed, policies and large projects with long-term goals may be devised some time before the actual implementation, which itself may take place over longer periods of time. In such conditions, modular design is more adaptable to shifts in circumstances, capacity demand, technological innovations, demographic, social and economic trends, and so on.

It may be challenging to fully operationalise this principle in different policy domains, starting from identifying what exactly may be a 'module' (Anderies and Janssen 2013) under different circumstances, goals, and organisational and normative policy settings. Nevertheless, we hold that putting explicit effort into exploring the possibility of modular solutions should prove productive, if only as a test heuristic, should some such form of modularity not be devisable and obtainable, that what is being designed may be fragile.

5.3.2 Decentralisation through Layering

The concentration of decision-making in a central entity increases the likelihood of disastrous outcomes, blow-ups, threats to survival, and jeopardy of projects and policy goals. A wrong decision made at the central level can have widespread effects, as is demonstrable in large investments and megaprojects (Ansar et al. 2017; Flyvbjerg 2017; Flyvbjerg et al. 2003). Instead, decentralisation allows for localised errors, which are less likely to propagate and trigger systemic failures. Additionally, by creating favourable conditions for trial-and-error without risking systemic blow-ups, decentralisation augments the benefits of modular design: tinkering, experimentation and learning. To clarify, forms of centralisation may be justifiable for pursuing certain policy goals, such as granting equity or some configuration of uniformity of conditions, opportunities and outcomes; or in circumstances with large fixed costs, economies of scale, and network effects. However, centralisation requires wariness of threats of fragilising the system and of jeopardising its antifragility, especially when the centralised action aims to micromanage the system, beyond setting the general frames of reference for individual and local action,

granting rights, supplying universal public goods, and addressing externalities and collective action problems.

A possible approach to pursue decentralisation is through layering and nested institutional arrangements (Ostrom 1995). Such institutional structures are potentially more socially inclusive, provide a plurality of actors with a 'sense of common objectives' (O'Riordan and Voisey 1998), offer discretionary space for action on local levels for adaptation, calibration and experimentation of context-sensitive solutions while implementing shared policy goals, and finally provide necessary (albeit not fully sufficient) conditions for 'skin in the game' (Taleb 2018) across the layers of decision-making.

Finally, specifically in spatial planning, forms of layering should also be devised in reference to the space and time scales of decision-making and action. As we have argued (Blečić and Cecchini 2020a), the perspective of antifragility should distinguish three planes for the planning practice: (1) the *via negativa*; (2) the shared vision and the 'coordination by means of future'; and (3) the space of the projects. These three planes operate on different time, spatial and institutional scales, from long-run and high-level (regional and above) of the *via negativa*, to short-term and strictly local of the space of the projects.

5.3.3 Redundancy

Redundant functions, tasks and information flows between modules and layers create fault-tolerant systems, functioning even if one component fails, as another component can assume its role. Redundancy in our context of policy design would primarily mean to devise mechanisms which can perform similar or substitutive functions in case of failures on local levels. Such redundancy, especially appropriate for critical components and functions, could be built into systems horizontally (by generating adequate spare capability or overcompensation in other local units/modules), and vertically (through preparedness of higher-order layers to take over functions, goods provision, management and regulatory tasks). An instance of institutional redundancy would be the sequential use of informal and formal rules for resource management: when informal rules fail, more formal higher-level institutional arrangements are activated as backup, which are more expensive but perform a similar function (Low et al. 2002). Building horizontal spare capability or vertical fallbacks may appear costly, but such costs should nevertheless be duly compared with the costs of the possible system's failures. For instance, in some circumstances in our domain, a redundancy design may not require assuring full functional integrity over short periods of time. Differently from the high-level redundancy necessary for the extreme robustness of a commercial airliner designed to continue flying even if many subsystems fail, in the domain of urban policies such

robustness against temporary disruptions or discontinuity of service may not be necessary. If that is the case, the policy design could devise contingency plans of 'graceful degradation',[5] the ability to maintain limited though crucial functions in adverse conditions or under temporary subsystems failures.

Strictly, while redundancy as a design principle is directed to strengthen robustness and resilience, the antifragile dimension emerges in the medium to long run and in combination with the other two principles mentioned above. Indeed, embedding adequate redundancies in the system permits and favours cycles of tinkering and learning through trial-and-error without jeopardising the essential established functions. Redundancies hence should help to advance dynamic adaptation through innovation in response to internal or external stressors and perturbations, and should encourage 'fail fast' practices ('fail early, fail better, test early, fail cheaply') to cut sunk cost losses and to favour quick pivoting to new approaches and solutions.

5.3.4 Resist the Urge to Suppress Randomness

'[I]f antifragility is the property of all those natural (and complex) systems that have survived, depriving these systems of volatility, randomness, and stressors will harm them. They will weaken, die, or blow up' (Taleb 2012: 5). This general heuristic can have many different declinations in urban policies. One is to relax the pursuit of excessive optimisation and efficiency. Optimising subsystems, processes and services is uncontroversial only under stringent conditions (Blečić and Cecchini 2020a), and can hardly be applied to urban systems in general, where agents pursue their autonomous ends and life plans within a shared spatial, social, cultural and economic context. The drive for efficiency and optimisation can especially be problematic when it only considers immediate first-order effects, as it can reduce the optionality, remove protective safeguards and redundancies, decrease the potential for adaptations, inclusion, opportunity of exaptation (Johnson 2010) and changes in urban uses, in view of inevitable evolution of ends, needs and desires. Allowing for, instead of suppressing, internal randomness may also have two other long-term effects on antifragile evolution of policies. The first is that, in the case of more open-ended policy goals (such as urban regeneration, or revitalisation of peripheral territories), the policy should be open and embrace the possibility of serendipity, of stumbling upon opportunities which may refocus the goals and

[5] 'Graceful degradation' is often evoked as a design principle in web-based software development, aiming at creating a fully functional website or application that performs optimally in the latest browsers, while still providing crucial content and features in older browsers even if the experience may not be as advanced.

discover yet unpredicted means to achieve them. The second effect is that the policy processes build social capital and future capability for coordination and collective action (Olson 1971).

5.3.5 'Skin in the Game'

While this is a general principle inviting to set the symmetry and sharing of risk by decision-makers with the potential (negative) impact of their decisions (Taleb 2018), the 'skin in the game' acquires a particular significance in the kind of modular, multi-layered and multi-actor policies where decision-making and responsibilities may be distributed and attributed through different vehicles and organisational schemes (administrative norms, ad hoc regulations, contracts, collaboration partnerships, and so on). This principle also recommends aligning incentives and risk management schemes for public administrators and officers, who frequently act as gatekeepers and have much sway over decision-making. Mobilising these actors to more proactive attitudes, open to innovation, normogenesis and flexibility in mechanism design, which inevitably entails some risk-taking, is often a decisive precondition of an effective and adaptable policy design.

5.3.6 Chesterton's Fence

Inspired by C.K. Chesterton's point never to take down a fence until you know the reason it was put up (Chesterton 1929), in the strict sense this heuristic is a corollary of *primum non nocere* in the domain of public policy. Chesterton's point was of course an admonishment that interventions on social systems should not be made until the reasoning behind the existing state of affairs is understood.[6] In our domain this would primarily mean the awareness that policies operate in contexts of agonistic pluralism, and sometimes of irreducible conflicts and structural antagonisms, even if collaborative approaches and co-design (Blomkamp 2018) can be pursued in some circumstances. In a wider sense, pertaining to antifragility, the point is to operate to remove fragilisers of social cohesion, by which we do not mean a stationary 'state of harmony', but a dynamic, ultimately precarious, outcome of conflicts, reciprocal accommodations and partisan mutual adjustments. An example of a fragiliser of social cohesion is when excessive economic inequality, coupled with particular institutional arrangements, turns into inequality of real opportunities, capabil-

[6] Incidentally, Chesterton of course invented his proverbial fence as a metaphor, but in urban design and architecture sometimes we should perhaps take him quite literally, as if he was talking about actual fences, walls and barriers.

ities and the possibility to meaningfully participate in the democratic political process, undermining the social cohesion from within (Sandel 2012).

5.3.7 Optionality

The common tenet to all the above principles is building and promoting optionality as a fundamental precondition of antifragility. Optionality is the property of having options (possibilities, rights, entitlements, capabilities to do, to have, to become, to change the course of action, to reverse prior decisions, and so on), but not obligations or constraints. Greater optionality embedded in a course of action offers the possibility of a favourable asymmetry between the action's upsides and downsides, and allows benefiting from unpredicted and unpredictable opportunities, while limiting the possible harm arising from threats.

After all, optionality is what sets antifragility apart from resilience: while at the core of antifragility, optionality in the strong sense is absent in resilience. We say 'in the strong sense' because the goal of resilience may be pursued for institutions, services, infrastructures, environmental systems, that are also valuable for providing certain optionality to people. But in this sense, resilience at its face value does not contemplate the possibility that these institutions, services, infrastructures, systems themselves evolve and improve, even in terms of their purpose of providing optionality, specifically from the unexpected opportunities with time. For that, the goal of antifragility must be put to work.

5.4 ON THE '15-MINUTES CITY', THROUGH THE GLASS ANTIFRAGILE

In this section, we want to illustrate how our conceptual framework could be employed to critically examine the idea of the '15 (or 20)-minutes city' (Moreno et al. 2021; Whitzman 2017), focusing on possible fragilisers, and on what may be required to pursue such goals. The policy goals of the '15-minutes city' aptly fit into the domain of evolutionary policy design, constitutively requiring a combination of top-down actions, bottom-up organising, and convergence of autonomous economic and social processes, to obtain the desired results on the ground.

Our premise would be that the so-called '15-minutes city' is not a bad idea if it is proposed without nostalgia, without appeal to imaginary communities, without fixed modules (such as that of the so-called 'neighbourhood units'; Perry 1929), and if it is a projected towards the future, but starting from the 'really existing city'.

The idea finds its origins in a certain 'rediscovery' of proximity, which cannot be abandoned even in the age of extreme globalisation and of the per-

vasive presence of information technologies. This is a lesson arising from the practices of everyday life, work and consumption, and has manifested itself acutely in the period of the COVID-19 pandemic (Blečić and Cecchini 2020b). Among many 'rediscoveries' (which nevertheless risk to remain temporary) of the acute period of the pandemic crisis – alongside the realisation that there *is* such thing as society, and of the decisive role of the public and of the state in preventing societies from collapsing – is the recognition that a certain dose of self-sufficiency may be necessary at national, regional and local level, and that an antifragile system cannot be based on abstract criteria of efficiency and optimisation (as has been thought possible for the size and localisation of health services), or of competitiveness (as has been thought for agricultural production), or of 'excellence' (as has been repeatedly said for the funding of universities).

This does not mean that efficiency, competitiveness and quality are not among the variables to take into account, but it means that the ability of a system to withstand perturbations, to absorb shocks of unlikely events (be they Black or White Swans), to recover and to better adapt, also implies redundancies, plasticity, duplication and the possibility of exaptations, just as it implies that some types of goods and services are produced locally even though it may not be 'efficient', with multiple possibility of exchanges between supra-local 'reservoirs' and interconnected networks.

The apparent originality of the '15-minutes city' hinges on us somehow having forgotten the importance of proximity, and of Jane Jacobs. Welcomed be such reminders, but whilst recollecting, we should not at the same time forget Christaller and Mandelbrot. That is, the '15-minutes city' should not be an appeal to a 'flat localism' and to an autarchic self-sufficiency of the city of proximity. Rather, it needs to fully engage the multi-scalar nature of cities and call for a 'fractal localism' (Taleb 2019), with adequate modes of coordination and integration (Bandarin et al. 2020), as a source of antifragility and antifragile policies.

Thus, a '15-minutes city' must not be a naïve and romantic idea of 'urban villages', but that of urban systems which at the local level of neighbourhoods can offer a high accessibility of goods, services and capabilities to each person, according to their needs and abilities, in a reasonable time, on foot or by means of 'soft' mobility, such as to be intrinsically fairer and protective of the most fragile, but also capable of adapting to exogenous shocks and unexpected events, and learning from them.

In Europe at least, such policies should start from the city that really exists. Because the total number of inhabitants will not grow much, because on average the density is relatively high, and because in many cases there is a large unused and underused stock of buildings and areas within cities, so that – starting from the existing city – there is impressive work to be done to

restore, recover, reconvert, redevelop and regenerate this heritage from the architectural, urban, infrastructural, economic, social and cultural point of view. An impressive work, but a work which in many cases does not need to take place all at once: it can be a 'great project' on an urban scale, without being a large-scale project. Indeed, if designed in a systemic and long-term dimension, the fact that it can happen in a modular way through time can be a great advantage, as it can promote its antifragility.

Let us, however, touch upon two potential 'structural' fragilisers, taking at face value Moreno's definition of the '15-minutes city' as having '*4 composantes majeures: la proximité, la mixité, la densité, l'ubiquité*' (Moreno 2016).

Although Moreno understands *mixité* primarily as a mixture of functions, for many such functions only a social *mixité* would assure that outcome. Otherwise, it is indeed hard to imagine non-fragile mechanisms to address the scarce provision of services, not only public services, but also commercial, entertainment venues, bars and restaurants, given that their localisation can hardly be imposed, and given that economic preconditions may not be present on the ground. This is likely a blind spot in many of the concrete attempts to turn neighbourhoods into '15-minutes' ones. Otherwise, the goal will likely be reached only in the neighbourhoods which already possess a certain favourable *mixité*, not far from already being the 'city of proximity'.

Therefore, a '15-minutes city' probably cannot do away with housing policies, without which interventions on public spaces often prove insufficient to affect social segregation and to promote 'diversity' of residents. This is unavoidably a gradual process, for which a starting point could be to promote not only developments in less-advantaged neighbourhoods, but also a significant share of 'contracted' or public housing within regeneration plans in more better-off areas.

Further, we want to suggest that an endowment particularly relevant to make the city of proximity work is that of schools. Not only because their redistribution, refunctionalisation, extension, rethinking could favour a substantial reduction of forced mid-distance mobility, but also for the role those spaces could have as poles for neighbourhood services and diffuse cultural activities.

Finally, we arrive at a discussion of urban rent as a source of fragility. This offers us the opportunity to add some specifics to our previous claim that the *via negativa*, as a set of general and long-term rules and constraints, while preserving and increasing the resilience and antifragility of urban systems, does not exclude the possibility of structural transitions and 'regime changes', as long as they preserve principles and forms of generality and superordination, escape from short-term contingencies and conveniences, and reduce fragility without introducing new sources of fragility.

For urban systems, the modes in which urban rent is created and distributed may be a formidable structural source of fragility. It can be argued – convincingly, in our opinion – that the *private appropriation* of (most of) urban rent is a powerful fragiliser of cities, for political, environmental, even cultural reasons.

The well-known moral argument is that of the 'unearned increment' (Mill 1848): the idea that the increase in land values due to favourable localisation, presence of services and public infrastructures, or due to the general progress of society, does not belong to (or, in some variants of the argument, is not deserved by) the land owners, but rather to the entire society.

To this we want to add the argument of political-institutional dysfunction. It in fact seems to us that the predominant modes of private appropriation of urban rent are among the main causes of dysfunction of politics and planning practice at the levels of local government, at least from our Italian observatory. Even when not spawning downright corruption and graft, it is a source of a massive political and economic pressure on local politicians and public officials, to which they often, to a lesser or greater degree, cannot but surrender. Yet it is hard to imagine how could it possibly be otherwise, when the decisions on the allocation of building rights and land uses are constitutively discretionary, and at the same time differentiate among land owners in terms of potential rent extractable from urban developments (Chiodelli and Moroni 2015).

Such pressures further fragilise cities: developments maximising rent extraction at the expense of liveability and quality of public spaces, lack of funding for the 'public city' and public housing, loss of diversity, economic monocultures, social uniformity of neighbourhoods, urban sprawl, are all phenomena in many ways concaused by the mechanisms of the creation, extraction and private appropriation of urban rent.

We should push our point even further and wonder about the long-term cultural consequences of normative-institutional arrangements which favour a systematic private appropriation of a collectively produced value, which in many respects should be considered a common-pool resource. Is such distribution of the rent value not a permanent, perhaps latent, but by all means contagious hotbed of social rivalries? If the collectively produced rent represents a relevant share of the wealth created,[7] if its distribution is conditioned by

[7] In his *Capital in the Twenty-First Century*, Piketty (2014) describes the progressive increase in inequality in the distribution of wealth in developed countries since the 1980s and after the 'historical anomaly' of the first three post-war decades. Piketty's central thesis unfolds around the persistence of the condition of greater return on capital with respect to the general growth of national income. Given the unequal distribution of ownership titles on capital and the strengthening of the 'patrimonial capitalism'

planning, and hence its private appropriation is determined by a discretionary (political-administrative) mediation, do we not have in rent a perfect 'object of desire' which, following René Girard's insights (1977; Girard et al. 1987), is capable to bring about an escalation of mimetic rivalries? This may have deep implications for the quality of social relations and cohesion, for the functioning of government mechanisms, and on the latent violence in local politics and communities.

Ultimately, not in one, but in the joint corrosive operating of all these ethical, political, economic, social and cultural consequences, and of their fallouts, resides what makes the private appropriation of urban rent based on discretionary and differential logic a vigorous 'fragiliser' of the city and many urban policies.

While the urban rent cannot in principle be eliminated – its value stemming from ineliminable localisation preferences of agents – the point instead is who appropriates it and through what mechanisms. Our key point is therefore that the rent becomes a fragiliser: (1) when its actual realisation depends on the discretionary differentiation between agents; and (2) when it is privately appropriated.

An antifragile remedy would proceed through a *via negativa*. As we have said, under certain conditions the logic of the *via negativa* does not exclude the possibility of triggering structural transitions and even radical regime changes. These conditions are that it is a transition operating through general and abstract rules, without aspiring to overcontrol and micromanage the internal dynamism of the system, its capacity for self-organisation and autopoiesis, and the propensity of agents for dynamic adaptation. Under these conditions,

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(Milanović 2014), this imbalance involves a progressive concentration of wealth, and therefore its more unequal distribution. As various scholars have observed (Homburg 2015; Milanović 2014; Stiglitz 2016), in his book Piketty defines 'capital' extensively, and uses the term largely interchangeably with that of 'wealth', without distinguishing between 'productive' and 'unproductive' capital, and above all by including the value of assets, thus including the capitalisation of land rents. In short, Piketty classifies any asset or security capable of generating income for its owner as capital, including the income implied in the capitalisation value of real estate, which incorporates the value of the underlying land rents. This terminological clarification is not trivial, as it allows Stiglitz (2015, 2016) to point out that, rather than attributable to the conventionally understood return on productive capital, most of the increase in the concentration of wealth can instead be attributed to ownership over sources of rent, that is, to the higher income deriving from these rents and their capitalised values. Here, among various forms of income, the pre-eminent role seems to be covered by land rents. In fact, a breakdown by sector of the data used by Piketty shows how the relative increase in capital income compared to labour income is almost entirely attributable to the housing sector (Rognlie 2015), and in particular to the income implied in the value of the real-estate assets.

a different regime of *jus aedificandi* and of land property rights, or introduction of fiscal tools for land value capture (Ingram et al. 2012), would not violate the principles of policy design for antifragility.

5.5 CONCLUSIONS

By dedicating this chapter to an attempt to provide a conceptual bridge between theory and practice for incorporating antifragility as a policy goal and design principle, our primary purpose was to lay some of the groundwork necessary to operationalise the concept of antifragility in the domain of urban and territorial policies and planning.

Going from here, we see (at least) two promising directions for future research and developments. One is strictly operational, related to our initial caveat that the general principles which we presented here need to be adapted to the wide variety of what usually falls under the umbrella of urban and territorial policies. This creates the need for further specification and specialisation of principles, exploring the ways in which they may be concretely relevant and pursuable for different reference classes of policies and projects.

A second promising line of research is to adopt the conceptual framework of the fragility–robustness–resilience–antifragility quadriad for empirical research, to test how design choices, in a sample of past policies and projects within different reference classes, actually impacted upon their evolution and antifragility. Likely, these two lines are methodologically intertwined, and both necessary for ours to ultimately become a viable paradigm.

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6. Institutional fragility and institutional malleability: a reflection starting from the Covid-19 pandemic

Stefano Moroni

> We must stay vigilant and protect the right to health as well as the rule of law and prevent the virus from infecting the rule of law (Canestrini, 2020: 122)

6.1 INTRODUCTION: WHAT CAN BE FRAGILE?[1]

We can say that something is 'fragile' if shocks, perturbations, stressors can damage, break or destroy it.[2] Therefore, what is fragile is not adaptable. In this regard, Taleb (2012: 12) writes:

> Think of anything fragile, say, objects in your living room such as the glass frame, the television set, or, even better, the china in the cupboards. If you label them 'fragile', then you necessarily want them to be left alone in peace … A fragile object would not possibly benefit from an earthquake or the visit of your hyperactive nephew.

According to Taleb, this notion of fragility can be employed when discussing, for instance, states of health, natural environments, physical structures (for

[1] This work is supported by the RIBA project 'Norms, Uncertainty and Space (NOUS)', Department of Architecture and Urban Studies, Politecnico di Milano (Italy).

[2] Compare with Chiffi and Curci (2019: 56): 'In a broad sense, by fragility we refer to the quality of an object or system (but metaphorically also of a person, a social group, a territory, etc.) to be easily "broken" (from the Latin *frangere* = to break) even by a minor, ordinary, or non-violent force'. They add: 'Fragility is an intrinsic characteristic associated with a specific fracture modality (whether short, sudden, or abrupt) that is independent from the specific type of shock' (Chiffi and Curci, 2019: 56).

example, buildings and bridges), organisations (for example, the banking system) and institutions (for example, forms of governments). In this sense:

> you can easily tell that your grandmother is more fragile to abrupt changes in temperature than you, that some military dictatorship is more fragile than Switzerland should political change happen, that a bank is more fragile than another should a crisis occur, or that a poorly built modern building is more fragile than the Cathedral of Chartres should an earthquake happen (Taleb, 2012: 9)

This chapter focuses on institutional fragility. Attention will mainly be paid to formal institutions. Section 6.2 defines institutional fragility and distinguishes it from institutional malleability. Section 6.3 considers a case study by asking whether Italian public institutions have proved to be fragile – and/or malleable – in light of the recent Covid-19 pandemic. In section 6.4, the main concepts at stake are discussed critically. Section 6.5 highlights the main findings and generalises them.

6.2 PRELIMINARY ISSUES: TWO BASIC CONCEPTS

6.2.1 Institutional Fragility

In regard to institutions, we can assume that they are fragile if and when they are vulnerable to shocks to the point of experiencing serious 'institutional breaches'.[3] In this event, 'breaches are a form of disruption to institutions' (Daskalopoulou and Palmer, 2021: 2). An institutional breach is any unexpected disruption 'that violates or challenges the norm-governing social relations and order' (Daskalopoulou and Palmer, 2021: 2).[4] In the case of institutions as well, fragility implies non-adaptability.

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[3] In the academic literature, there are at least three different uses of the expression 'institutional fragility': (a) fragility as vulnerability (that is, vulnerability to shocks); (b) fragility as disfunctionality (that is, institutions not perceived as legitimate by the population, along with their inability to control a territory and to provide essential basic services; Bertocchi and Guerzoni, 2012; Nay, 2013; Gisselquist, 2014; Pérez Niño and Le Billon, 2014; Feeny et al., 2015; Amorós et al., 2019); and (c) fragility as being 'out of axis' (that is, 'a situation in which different institutional dimensions are not progressing at the same pace and thus creating internal friction and conflict during development': Shi et al., 2017: 452–453; see also Li et al., 2021, 2022; Oliveira and Meyfroidt, 2022). The first of these notions is the one accepted here. Obviously, labels are nothing but labels; what is important is to clarify how they are used. (Note that there may also be situations where two or even three of the aforementioned different forms of fragility are in place.)

[4] On the idea of 'institutional breaches', see also Herepath and Kitchener (2016).

6.2.2 Institutional Malleability

'Institutional malleability' can be defined as the capacity of institutions to readjust – without 'breaches' – to new circumstances, especially stressing ones.[5] In explaining institutional malleability, Pulignano and Waddington (2020: 8) write: 'in new circumstances, such as the adoption of neoliberal economic policies or financialisation, the objectives for which institutions were initially intended may change. Such change may occur without any corresponding amendment to the regulations that underpin the institution'.[6] Similarly, Baccaro and Howell (2011: 522) define institutional malleability as follows: 'subject to a new set of pressures and constraints, the same set of institutions can be re-engineered to function in a manner very different from that of the context in which they were created'. Differently from fragility, institutional malleability obviously implies adaptability.

Note that institutional malleability is something partially but significantly different from mere 'institutional elasticity (or resilience)', that is, the capacity of an institution to return to its initial state after having undergone a significant shock (Barin Cruz et al., 2016; Álvarez at al., 2022; Awasthi et al., 2022). Furthermore, note that 'institutional malleability' and 'institutional agility' are also not the same: agility mainly – and merely – relates to the speed of response within given structures (Janssen and Van Der Voort, 2020).

6.3 CASE STUDY: THREE MAIN STRATEGIES OF THE ITALIAN INSTITUTIONS IN RESPONSE TO THE COVID-19 PANDEMIC

As is well known, the Covid-19 pandemic severely impacted on Italy.[7] After a first period of hesitation (Colombo, 2021; De Blasio and Selva, 2021), Italian

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[5] The term is clearly modelled on its traditional use in the material-physical field.

[6] 'Institutional plasticity' could be a synonym. As Notteboom et al. (2013: 29) note, institutional plasticity refers to 'a situation where a range of alternative development trajectories are possible within the overarching institutional system without necessarily breaking out of the existing path. Plasticity suggests an elastic stretch of existing institutions and institutional arrangements through deliberate action and flexible interpretation of these arrangements by actors' (compare with Lok and De Rond, 2013; Hatani, 2016; Ghaffari et al., 2021). See also the idea of institutional flexibility: 'institutional flexibility … enables administrators to forgo standard procedures to improvise (sometimes outside of the rules) to adapt and respond to rapidly changing circumstances' (Carter and May, 2020: 267).

[7] For an overview of how the Covid-19 pandemic impacted on Italy in various respects, see for example Berardi et al. (2020), Ortenzi et al. (2020), Negri and Mazzoleni (2021), Vicentini and Galanti (2021), Rossi (2021) and Zia and Kalim

institutions adopted various structural strategies. For example: (1) a prolonged state of emergency was declared in order for the government to be able to act outside the ordinary constraints and obligations; (2) the Parliament moved into the background and the Executive increased its power and range of action; and (3) extraordinary commissioners were appointed for the centralised management of many organisational aspects.

6.3.1 Prolonged State of Emergency

With a resolution of the Council of Ministers, a state of emergency was declared on 31 January 2020, for six months. A state of emergency allows the government to act differently from current legislation.[8] It also allows the Civil Protection Department, the Ministry of Health, regional governments, and even municipalities,[9] to take extraordinary measures. A government resolution of 21 April 2021 extended the state of emergency to 31 July; Decree-Law no. 105 of 23 July 2021 further extended it to December 2021; and then Decree-Law no. 221 of 24 December 2021 extended the state of emergency to March 2022 (when it was finally lifted). It should be noted here that the Italian Constitution only provides for a state of emergency in the case of war (art. 78).[10]

6.3.2 Expanded Role of the Executive Branch

During the pandemic, the executive branch took a central role, while the Parliament remained in the background (Ronga, 2020; Bruno et al., 2021; Corradetti and Pollicino, 2021; Pedersen and Borghetto, 2021; Piccirilli,

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(2021). The first local case of contagion – concerning a person who had no connection with China – was detected in Codogno (Lombardy) on 20 February 2020. The interview with the doctor who identified this case – partially deviating from the officially mandated procedures – can be read in Chiffi (2021: 161–162).

[8] In this regard, see *Codice della Protezione Civile,* 2018, art. 24.

[9] See, for example, Decree-Law no. 112 of 31 March 1998, art. 17, and Decree-Law no. 267 of 18 August 2000, art. 50.

[10] As Nicola and Scaccia (2021: 55) write:

> The Italian Constitution, unlike the famous models of Article 48 in the Weimar Constitution of 1919, Article 16 of the French Constitution, Article 116 of the Spanish Constitution, and Article 48 of the Hungarian Constitution, does not include a specific provision regulating a state of emergency. Except for a declaration of war, when Parliament can vest in the Executive all necessary powers with no constraints, the Italian Constitution does not provide for extraordinary emergency powers.

Compare with Omizzolo and Sodano (2022) and Vedaschi (2022). On the general issue, see also De Angelis and de Oliveira (2021).

2021; Vedaschi, 2022). Regulatory measures (for example, lockdowns[11]) and interventions of other kinds (for example, benefits) were mainly introduced by means of Decree-Laws and Prime Ministerial Decrees (DPCMs). Note that DPCMs are only issued by the Prime Minister – and not by the Council of Ministers – and must not be converted into law by Parliament. As Rullo (2021: 203) observes, expanding the use of DPCMs in this way 'has brought about significant changes in the process of government decision making by showing an increasingly centralised control over policymaking'. Along the same lines, Vedaschi (2022: 124) notes: 'Wide resort to DPCMs is a blatant sign of concentration of powers in the hands not of the whole executive, but of [the] Head alone, which is very uncommon in the Italian parliamentary form of government' (see also Fittipaldi, 2021).

Considering the entire duration of the Conte government (that is, the government in office during the first two waves of Covid-19, from September 2019 to February 2021), the Parliament approved a total of 97 bills: 82 on governmental initiative and only 15 on parliamentary initiative.[12] Various actions implemented in the period further minimised the role of the Parliament. The mechanism known as '*fiducia*' (that is, a vote of confidence) was frequently employed to secure government measures; this was not only to accelerate the procedure, but also to prevent the Parliament from modifying the provisions defined by the government.[13] In general terms, during the Conte II government there were more than 500 central normative and administrative acts related to Covid-19, issued by more than 30 public institutions and agencies, including: the Presidency of the Council of Ministers, various Ministries (for example, the Ministries of Interior, Health, Transport, Economy, Education) and the Civil Protection Department.[14]

The subsequent Draghi government (that is, the government that took office from February 2021 to October 2022, after the Conte government) proceeded along quite similar lines. Decree-laws were again broadly used, and the mechanism of *fiducia* as well. The central normative and administrative acts related to Covid-19 issued during the Draghi government amounted to another 459,

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[11] In the period March 2020 to May 2020 (and starting from the DPCMs of 9 and 11 March 2020), severe lockdown restrictions uniformly affected the whole of Italy. Subsequently (see DPCM of 3 November 2020), and after the partial relaxation of lockdown measures during the summer, such restrictions only affected those Italian regions that exceeded specific epidemiological thresholds (November 2020 to January 2021); see Conteduca and Borin (2022).

[12] See https://www.openpolis.it (accessed October 2021).

[13] During the Conte II government, and considering both the Chamber and the Senate, a total of 39 requests for *fiducia* were posed, at an average of 2.4 per month. See https://www.openpolis.it/ (accessed October 2021).

[14] See https://www.openpolis.it/ (accessed October 2021).

as of July 2022.[15] It should be stressed that the new government retained the same health minister who had been in office in the previous government. Note that Mario Draghi was directly invited by Italy's President Sergio Mattarella to form a new government (Garzia and Karremans, 2021; Newell, 2022). All political parties represented in the Parliament joined the new government, with one sole exception (Monaco, 2022; Russo and Valbruzzi, 2022). Also to be noted is that the pandemic situation during the Draghi government gradually improved (for example, the new variants of the virus proved to be less lethal; more and more citizens were vaccinated).

6.3.3 Special Covid-19 Commissioners

The highly centralised approach that characterised the Italian normative response was also adopted for management issues, with the appointment of national commissioners to organise the production and distribution of medical devices (for example, masks), administration of the vaccine, and so on. The first commissioner, appointed by DPCM of 18 March 2020, remained in office for about one year and had an influential role and wide powers (Camporesi et al., 2022). During the period of his mandate, more than half of the public calls for tenders related to the Covid-19 emergency were issued by the commissioner.[16] He introduced several ordinances (one of them imposed a cap on the retail price of face masks: *ordinanza* no. 11 of 2020).[17] In this case, 'general norms have been waived, and large powers have been entrusted to the commissioner that bypassed the tight enforcement system of the ordinary framework' (Di Mascio et al., 2020: 623). The first commissioner frequently compared the pandemic situation to a war in order to stress its dramatic nature (Antonelli et al., 2022). Note that the commissioner obtained a special '*scudo legale*' (legal shield), which relieved him of certain legal responsibilities (Decree-Law no. 18 of 17 March 2020). A second commissioner – an army general – was appointed by DPCM of 1 March 2021 and remained in office until March 2022.

6.4 DISCUSSION: TWO MAIN ISSUES

Italian public institutions do not seem to have proved fragile in the face of the recent pandemic. Indeed, they reacted to the pandemic without 'breaking

[15] See https://www.openpolis.it/ (accessed October 2022).
[16] See https://www.openpolis.it (accessed September 2022).
[17] The special commissioner's numerous ordinances are available at www.governo.it/dipartimenti/commissario-straordinario-lemergenza-covid-19/cscovid19-ordinanze/14421 (accessed September 2022).

up'. There were no 'institutional breaches':[18] institutions adopted a series of strategies so as to avoid them amid the severe shock of the pandemic. Italian institutions therefore demonstrated a high degree of malleability. Two observations seem relevant in this regard.

6.4.1 First Point: Malleability is Not Always Desirable

The issue here is that, in the case of institutions, malleability is not always good, and it is not good in itself (likewise, adaptability is not always and in itself desirable). It depends on how malleability is used, and in relation to exactly what.

In this regard, it is important to recognise that institutions are totally different from other organisations or bodies (for which malleability may almost always be desirable). Institutions have to always ensure a certain degree of predictability and certainty, especially in regard to regulatory and normative measures (Kasper and Streit, 1998; Moroni, 2007; Boettke et al., 2008; Alonso and Garcimartín, 2013).

This aspect came under pressure during the pandemic. The kind of malleability embraced by the Italian institutions during the pandemic created a sort of 'normative uncertainty': a situation in which the normative framework is unstable and confusing (that is, with continuous and unpredictable changes of direction).[19] As Canestrini (2020: 118) observes, in Italy during the pandemic period: 'More and more restrictions were applied on a day-by-day basis: the roll-out of the new restrictions [was] chaotic, as they came from many different sources'. In a similar vein, Nicola and Scaccia (2021: 68) note that the overregulation of the lockdown resulted in a 'patchwork of ambiguous, sometimes contradictory rules … impossible for civil servants, politicians, and professionals to grasp, let alone citizens who were at a loss in this legislative jungle' (on this, see also Algostino, 2021).

The necessity of the particular kind of institutional malleability embraced by the Italian institutions has been defended by invoking the 'black swan' nature of the Covid-19 pandemic. However, it should be noted that, contrary to what

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[18] For instance, 'the pandemic did not prompt a political crisis. Rather, it had the effect of blunting the frontal opposition of the League [the Lega party] and strengthening the standing of the government with the public' (Bull, 2021: 149).

[19] Frediani (2021: 16) observes that in a pandemic there are two different sources of uncertainty: 'The first uncertainty is that which arises from science and its responses in the face of a virus yet to be explored. The second uncertainty is that which comes from the institutions called upon to take appropriate and not disconnected action'. On the issue of institutional/normative uncertainty, see Newig et al. (2005), Bylund and McCaffrey (2017), Dewulf and Biesbroek (2018) and D'Andrea (2023).

many assume, the Covid-19 pandemic was not a 'black swan' event at all; and this is according to the author (Taleb, 2007) who invented this metaphor.[20] Considering the question 'Is Covid-19 a black swan?', Phan and Wood (2020: 427) correctly concluded that, on the basis of the definition of what a black swan is, and on everything that is known about the aetiology and progression of the Covid-19 disease, the answer can only be negative.[21]

In other words, even if the appearance of specific viruses is obviously unpredictable, the possibility of having certain kinds of viruses, and their general features, are foreseeable in advance.[22] As Osterholm (2005: 1839) noted, an influenza pandemic has always been a planetary threat; in the past 300 years, ten pandemics of 'influenza A' have occurred. Today, reading the many articles that years ago clearly identified the risk of certain kinds of pandemics occurring is enlightening. Fan et al. (2018: 129) wrote: 'Few doubt that major epidemics and pandemics will strike again and few would argue that the world is adequately prepared'. Having underscored the continuing threat of pandemic flu and similar diseases, Smith and Fischbacher (2009: 4) noted:

> Within Western nations, we enjoy greater prosperity and health … What has changed is the manner in which risks are generated, escalate and are transmitted across organisational and other 'boundaries'. Our interconnected societies help to ensure that the spread of transmission of certain forms of disease is faster than for previous generations. There is also the problem of new … zoonotic infections: diseases capable of crossing the animal–human boundary.

Consider, finally, what Khanna et al. (2008: 480) wrote:

> Human influenza outbreak has the potential of triggering a pandemic when a new influenza virus appears against which the human population has no immunity. With the increase in global transport and communications, as well as urbanisation and overcrowded conditions, epidemics due to the new influenza virus are likely to quickly take hold around the world leading to enormous numbers of deaths and illnesses. Outbreaks of influenza in animals, especially when happening simultaneously with annual outbreaks in humans, increase the chances of a pandemic through the merging of animal and human influenza viruses.[23]

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[20] See https://www.newyorker.com/news/daily-comment/the-pandemic-isnt-a-black-swan-but-a-portent-of-a-more-fragile-global-system. See also Taleb's interview at https://www.youtube.com/watch?v=BVHBszRrkbg (accessed October 2021).

[21] On this, see also Deakin and Meng (2020), Meßerschmidt (2020), Murphy et al. (2020), Sarkis et al. (2020), Fiorini and La Gioia (2021), Franzke and Czupryna (2021), Krausmann and Necci (2021), Naudé and Vinuesa (2021) and Bach and Meyer (2022).

[22] On the difference between 'specific predictions' (that is, prediction of details) and 'qualitative predictions' (that is, predictions of the principle), see Moroni (2015).

[23] See also Nguyen-Van-Tam and Hampson (2003), Cooper et al. (2006), Colizza et al. (2007) and Saunders-Hastings and Krewski (2016). Interestingly, issues such as

Scholars therefore knew that a certain kind of pandemic was due to happen; they just did not know exactly when it would do so (Kliger, 2021). In conclusion, public institutions can be prepared regarding the general features of certain possible threats to health.[24]

To be clear, certain restrictions on citizens' action (even if not necessarily all of those introduced[25]) were unavoidable during the pandemic. What is debatable is the way in which they were introduced, maintained and enforced. Therefore, the point is obviously not that everything was negative in the Italian reaction; rather, it is that non-existent black swan situations cannot be an excuse for unpreparedness and for unconstrained institutional malleability.

6.4.2 Second Point: Being Non-Fragile (and Being Malleable) Does Not Automatically Mean Being Antifragile

According to Taleb (2012: 3):

> Some things benefit from shocks; they thrive and grow when exposed to volatility, randomness, disorder, and stressors and love adventure, risk, and uncertainty. Yet, in spite of the ubiquity of the phenomenon, there is no word for the exact opposite of fragile. Let us call it antifragile. Antifragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better.

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ethical guidelines for decisions appropriate in the case of a pandemic – and the role and scope of the law in this case – have also already been discussed critically (see e.g., Thompson et al., 2006; cf. Gostin, 2006; Gostin and Berkman, 2007; Martin, 2009).

[24] It should be noted here that a pandemic plan existed in Italy (see http://www.salute.gov.it, accessed October 2021), but unfortunately it had not been updated since 2006.

[25] Some of the constraining measures during the Italian lockdown were effective and desirable (for example, the use of masks indoors, social distancing, the prohibition of gatherings), but this is not the case for all the measures adopted (doubts concern, for instance, the wearing of masks outdoors; the evening and night curfew; the closure of commercial activities where both consumers and shopkeepers could always wear a mask and where it was easy to limit entrances to a few persons at a time; the restriction of movement within the boundaries of the municipality in which a person was resident, independently of the extent of the municipal territory). Comparative studies (e.g., Bendavid et al., 2021; Boretti, 2020; Meunier, 2020; Fuss et al., 2021) have demonstrated that the very severe restrictions adopted in Italy – and in other countries that introduced similar measures – did not have effects, for instance in terms of mortality, that greatly differed from the less severe ones adopted in other countries, both in Europe and elsewhere. Note that the point here is not whether certain measures, cumulatively understood, had effects in curbing the pandemic in a single country, but which of these measures proved to be comparatively more effective among several countries.

Just as the idea of fragility can be applied to institutions, so too can the idea of antifragility (e.g., Magnuson, 2018; Smetana and O'Mahoney, 2022). Antifragile institutions are ones that benefit from shocks, for instance by avoiding the repetition of debatable forms of intervention, and by learning how to improve their credibility and viability (as well as their preparedness for the future).

In our case, it does not seem that Italian institutions were antifragile (at least, not from the beginning of 2020 to mid-2022). Their reactions to the first and the second waves of the pandemic were almost identical: that is, they perpetuated the state of emergency, maintained special powers for the executive branch, and appointed extraordinary commissioners.[26] Measures were very similar for the subsequent waves as well.

6.5 CONCLUSION

What has been said with specific reference to the Italian case study can be, in various respects, generalised.[27] In short, power – and public power especially – is rarely fragile (in the sense of the term accepted here), and is often malleable. However, malleability is not always and unconditionally desirable. Moreover, malleability does not in itself involve antifragility, that is, the capacity to learn from crises.

On systematically comparing declarations of emergencies in various countries during the first wave of Covid-19, Bjørnskov and Voigt (2022a) found

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[26] As Frediani (2021: 16) observes: 'The Italian government has been forced to adopt new measures to fight against the spread of the second wave of the pandemic. Unfortunately, the method has not changed, as if to show that there is still much to learn about how to implement precautionary measures'. Compare with Coccia (2021). Despite the severe impact on people's health of the first wave of the COVID-19 pandemic, many countries still show a low capacity 'for efficient national planning and timely application of best practices of crisis management; in particular, many countries apply ambiguous, delayed and uncertain policy responses in the presence of recurring waves of the COVID-19 pandemic crisis'; in general, it seems that numerous countries have not completely absorbed lessons learned about the negative effects of the COVID-19 pandemic crisis to support 'effective and timely […] decisions to cope with successive pandemic waves on the health of people' (Coccia, 2021: 7).

[27] On the expanded role of executive branches during the pandemic in other European countries, see Griglio (2020), Petrov (2020), Bolleyer and Salát (2021) and Engler et al. (2021). For a comparative analysis of countries that declared a 'state of emergency' to cope with Covid-19, see Lundgren et al. (2020) and Bjørnskov and Voigt (2022a, 2022b). On the issue of the state of emergency from a general perspective, see also Thomson and Ip (2020), Stasavage (2020) and Lachmayer and Kettemann (2022). For a discussion of how the 'rule of law' and the 'certainty of law' came under pressure in various countries during the pandemic, see Grogan (2022).

that the discretionary power which governments gained in this manner was more connected with a logic internal to institutions than to the severity of the epidemic in itself: governments behaved first of all as 'power-maximizers' driven by the 'political attractiveness' of declaring a state of emergency to absorb the shock. Moreover, Bjørnskov and Voigt (2022a) found that granting additional powers to the executives was not more effective in itself, and often had unintended consequences (on these issues, see also Bjørnskov and Voigt, 2022b).

As Cormacain and Bar-Siman-Tov (2020) observe, the Covid-19 pandemic raised challenges not only for healthcare services and economies, but also for many law-making systems. The severity of the crisis evidenced the weaknesses of legislative procedures and government strategies in various countries. The criticisable examples were in these cases magnified: 'knee-jerk legal reactions, executive dominance, lack of parliamentary oversight, poor democratic input, populist rather than effective laws … and a general disregard for the proper constitutional order' (Cormacain and Bar-Siman-Tov, 2020: 8). Consequently, they aptly note that it is necessary to reaffirm the following principles: 'parliamentary oversight and scrutiny, democratic accountability, transparency, legitimacy at all stages in the legislative process, observance of the Rule of Law, evidence-based law-making … proper separation of powers, and respect for human rights and the constitutional order' (Cormacain and Bar-Siman-Tov, 2020: 9).

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7. Fragility as a condition: the landscape perspective

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7.1 THE LANDSCAPE FOR FRAGILITY

Fragility is the outcome of a set of aspects related to and dependent on environmental, social, economic, political and institutional factors that require specific interpretation skills and novel operational attitudes (Chiffi and Curci, 2019) and that can manifest themselves in very different situations, places and environments. Fragility can characterise isolated environments, with resources that appear scarce or non-existent, or with a strong imbalance with respect to neighbouring and competing places that conversely appear dynamic and robust; it also characterises abandoned places or, on the contrary, those subject to the wear and tear of excessive pressures, as well as places exposed to known or unexpected risks. Therefore, they can all be fragile: the inland areas of the Apennines; abandoned Alpine valleys; many intermediate territories of the Po Valley and the valleys and plains of southern Italy; the coasts of unauthorised building and environmental degradation; the slopes exposed to serious instability phenomena; some suburbs or historical centres; large monofunctional settlements affected by abandonment and fragmentation, by the impoverishment of the social fabric and by conflicts.[1] But fragilities can also emerge and become evident in very robust, central and accessible places, affected by dynamic and seemingly vigorous economies: in the inner suburbs of a metrop-

[1] In recent years, at the Department of Architecture and Urban Studies of the Politecnico di Milano, the reflection on territorial fragilities, on their nature and geography in Italy, has declined in relation to both peripheral contexts in metropolitan areas and marginal areas, in particular Alpine and Apennine ones, as well as intermediate territories (Di Matteo et al., 2021, pp. 4–5); the department's activity of excellence is documented at https://www. excellence.dastu.polimi.it/laboratorio-fragilita. Reflection on fragilities has been strongly intertwined with that on inland areas, and has led to numerous studies, research and publishing initiatives, initially related to the National Strategy led by the Agency for Territorial Cohesion (agenziacoesione.gov.it) and mobilising a wide research network and numerous subsequent initiatives (De Rossi, 2018).

olis such as Milan, in the agricultural areas of rich but polluted economies of industrial monoculture, wine, livestock farming, the places where traditional agriculture persists but is marked by the loss of skills in landscape care, the coasts of reclaimed territories, exposed to rising sea levels and groundwater pollution.

Fragilities often depend on phenomena that produce changes in a gradual, non-obvious way, on dormant situations that can flare up in an unpredictable and unexpected way. They depend on time, and change over time; understanding them requires a process of historical interpretation and conjecture about future conditions. If we consider resoluteness as an attribute of robustness and thus as the antithesis of fragility, we would have to agree that in fact the landscape is a constitutively fragile 'material', since it is incessantly subjected to processes of change that make its assets fatally mutable and provisional, whether they are semantic and morphological, productive or physiological. Changeability and instability are in fact inescapable features of the landscape, which cannot escape actions that act on its forms and structures, biotic and abiotic, of human or differently induced morphogenesis, sometimes peremptorily and instantaneously, sometimes very slowly and incrementally. The landscape always wavers, oscillates, is a succession of mutations.

Therefore, in a perspective that contrasts fragility with the characteristics of stability and durability, the landscape offers itself as a privileged platform for verifying the conceptual and operational tightness of design positions in relation to fragility.

This chapter reflects on how conditions of territorial fragility can be recognised, interpreted and treated from the point of view of landscape and landscape design. The hypothesis we put forward is that landscape, in its cultural and operational meaning, represents a specific way of reconsidering territorial fragilities as a set of characterising qualities, and not as a negative condition to be overcome. If observed and interpreted through the lens of the landscape approach, fragilities suggest ways and spaces for design action capable of triggering and enhancing forms of active prevention and even territorial reinvigoration. In particular, we do not investigate the relations between landscape and fragility in search of solutions, but rather we turn to the attitudes and methods of the landscape approach to reconsider the status of fragility: it is not a question of denying it, fighting it or curing it, but of understanding its dynamics, origins and possible evolution, as well as its immanent uncertainty, considering them as constitutive meanings of the project. There is indeed a close link between fragility, uncertainty and the unexpected, and this is why the landscape perspective can act as a way of recognising, interpreting and dealing with fragility, because the landscape is the staging and action of fragility, it is the visible and at the same time the operating platform of fragility. The crucial question is therefore whether fragility – understood as

instability and impermanence, delicacy and transience, resistance to control and predetermination – can be a declination of the performance and durability of contemporary landscapes, when properly understood, interpreted and addressed through design.

In the following pages, an initial set of considerations discusses the role of landscape as a vantage point for the emergence of new forms of shared knowledge and awareness. Most design and planning actions addressing territorial fragilities are still based on deterministic and engineering models of prediction and control,[2] aiming to deal with fragilities by providing robust and circumstantial solutions to specific and punctual problems: embankments, weirs, slope and shoreline consolidation, dams, canalisation. Even the proposals which, more recently, have tried to place themselves within a new systemic perspective, consistent with the processes of ecological transition, find support in the most stringent functionalism and its rhetoric: the reassuring practice of the so-called nature-based solutions, the quantitative approach to urban forestation and the atopic application of urban water management techniques (water-sensitive design) are examples. These are technically innovative, replicable actions, but they suggest a way of operating based on isolated, overtly performance-based actions, which are satisfied only with the quantitative correspondence between predictions and outcomes and which lend themselves very well to technocratic use. Such actions are often accompanied by propagandistic images and rhetoric that are reductionist of the complexity of the phenomena involved and renounce confrontation with spatial outcomes, sedimented cultural meanings, the sense and mutability of places and their performativity.[3]

On the contrary, the landscape gaze and the landscape project do not offer solutions in terms of certain, predictable and definitive results, but suggest a different direction, capable of 'staying with the trouble' (Haraway, 2016). In its many forms, the landscape project lives, by its very nature and tradition – which are military, botanical-agronomic, of civil and health design, social, technological and humanistic, literary and figurative (Panzini, 1993; Jakob, 2018; Lanzani, 2020) – within an exploratory dimension and a search for effectiveness through forms of regulation, of continuous reformulation of

[2] These methods were precisely criticised by John Friedmann in the 1990s, proposing the overcoming of a linear mode of design, from blueprint to implementation, in favour of a different, interactive, dialogic mode aimed at the specificities of places and defined as non-Euclidean according to the expression used at the last Congrès Internationaux d'Architecture Moderne (CIAM) in Otterlo in 1959 by Aldo Van Eyck in his overcoming of the Modern Movement (Campos Uribe et al., 2020).

[3] An in-depth critical analysis of the neofunctionalist approach is proposed by Cristina Bianchetti (2016).

issues, sometimes of adaptation along lines of lesser resistance, of orientation of punctual or systemic actions in the search for effectiveness over time.

7.2 THE LANDSCAPE POINT OF VIEW

'Landscape' is a term with many meanings in a disputed field (Zagari, 2006), and it is worthwhile premising that it is precisely the coexistence, even contradictory, of its different meanings that makes its design dimension interesting and necessary. In the most common interpretation, drawn from the European pictorial and literary tradition, the landscape exists insofar as it is the product of a perceptive action, explicated on a territory and, inseparably, on the intertwined set of human and non-human facts that insist on it: the landscape exists insofar as it is seen; it is a hypothesis of a gaze on what is around us (Lassus, 1998). What is seen and what makes the existence of a landscape evident is the active relational field between the elements that contribute to it; it is the system of reciprocity and relationships that holds them together. It is a chaining, a system of rebounds, links and correspondences; it is the construction of a system of relationships that appear relevant and meaningful.

Deeply rooted in common sense and consolidated in jurisprudence,[4] this meaning exposes itself to ambiguities and misunderstandings in which, however, a substantial part of the operativeness and topicality of the idea of landscape resides. There are at least two reasons for the ambiguity.

The first reason is that landscape, as the outcome of a sentient perception,[5] is given as a possibility (of recognition, naming and, subsequently, of exploitation, custody or care) and not as the result of an immanent automatism. It therefore has an inevitably indeterminate character, in the sense of that it is not the result of deterministic cognitive processes. Landscape is a condition that knows no obviousness or self-evidence, but always needs to be diagnosed, affirmed, claimed and shared, and equally, cannot be imposed. It is a recognised or recognisable quality, an attributed or attributable value. The landscape does not exist in itself and therefore requires a constant exercise of questioning

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[4] '"Landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors', European Landscape Convention (in Italy, Law No 14, 9 January 2006, Article 1). 'Landscape is defined as the expressive territory of identity, whose character is the result of the action of natural and human factors and their interrelationships ... This Code protects the landscape with regard to those aspects and characteristics that constitute a material and visible representation of national identity, as an expression of cultural values' (Cultural Heritage and Landscape Code, Legislative Decree No. 42, 22 January 2004, Article 131).

[5] We insist on vision for the sake of simplicity, but it is quite clear that the senses, necessary for understanding the landscape, do not end with sight.

and verification to attest its existence or its exhaustion; or, again, to interpret the misalignments between the permanence, in the memory of individuals and communities, of territorial conditions that generate affection and identification, and the impermanence of the consistency and form of places (Ferrara, 2017). Similarly, the role of populations in the construction of the physical palimpsest of landscapes, in the sedimentation of their material and symbolic values, and the action of the same populations in the change and sometimes in the cessation of landscapes (Zagari, 2013), should be questioned.

Today, in the light of consolidated positions in the multidisciplinary debate expressed by the different voices of philosophers, ecologists, artists and designers (Clément, 1999; Descola, 2005; Ingold and Palsson, 2013; Kowarik, 2013; Latour, 1999), to speak of communities involved in the construction or depletion of landscapes can only imply their extension to forms of existence and sociality that are not only human. This opens up the second reason for the ambiguity inherent in the meaning of landscape that is being explored here, because if for a long time landscape has been assumed as a well-prepared scene, heir to aesthetic canons established in the wake of the European pictorial tradition, at least since landscape was established as an artistic genre with its own autonomy (D'Angelo, 2021), today we are witnessing new ethical and expressive interpretations. These, steeped in renewed environmental awareness and the recomposition of humanistic and scientific knowledge (Dominici, 2019), of art and biology (Latour and Weibel, 2020), find characters of ecological and aesthetic, economic and political quality, in metamorphosis and morphogenesis, in spite of stability, composure and permanence. The landscape emerges and is recognised in its immanent performativity, in its incessant endogenous work that ceaselessly modifies its assets, forms, values, meanings and destinies, expanding the dimensions of authorship, temporality and relevant techniques in its construction as a relational field. The landscape subsists and is recognised not only as object in vision, but also as subject in action. These ambiguities do not tend towards resolution, making the state of tension the immanent condition of existence and even vigour of the landscape. Dynamism, effervescence (Metta, 2022) and continuous transformative industriousness make the landscape an entity whose essence is action (Celestini, 2018). Thus, landscape is because it is seen, and is because it acts. Therefore, what we see – that particular quality that, when recognised, makes a country a landscape (Roger, 1997) – is a relational field made up of continuous drives and tensions, of generative and destructive restlessness, a seesaw of rebirths and ruins; what we see is therefore its effect and our effect on it. This point is crucial and firmly marks a change in the posture of contemporary culture towards landscape, with quite significant consequences for our purposes.

The first consequence is that perception and action are not opposing positions, but complementary, since the aesthetic qualities and semantic characters

that contemporary culture recognises and seeks in landscapes concern its modes and processes of becoming as a system of active and living relations, often transitory, ephemeral, even degenerative. Attention to the performativity of the landscape never implies its anaesthetic reduction in favour of the prevalence of pure biological and environmental data, but on the contrary, it implies the ability to read in the latter reasons of beauty and meaning, where the 'form' of the landscape is inextricably, though not deterministically, linked to its physiology.

The second consequence is that the landscape is understood today primarily as an operational code produced by the combination of different agencies, intentions and skills, including human ones, and therefore inevitably manifests characters of uncertainty and unpredictability. The avoidance of stability and prediction is often regarded as an insurgent cause of fragility. In fact, the reaction to risk, both at the local and neighbourhood scale and at the global scale, derives above all from fear of the uncertain and the unexpected (Beck, 1992). In a historical moment of epochal changes, of dangers and risks that are evident or feared, the concepts of disaster, catastrophe and apocalypse have a great deal of hold; above all because fear, as it is widely perceived, stems from the very idea of change itself, as well as or even more than from its actual manifestations. It is the change itself, it is the fact that the world is out of control, that puts us in crisis and causes fear, since 'transformation, transition, change are concepts towards which Western thought is unprepared, founded on an idea of nature conceived on the model of a subject-agent which sees itself at the centre of every process' (Celestini, 2018, p. 41). We are disturbed not so much because all aspects of the current conjuncture – environmental, economic, social – appear negative, but because they turn out to be uncontrollable. For this, the viewpoints of landscape architecture can be useful, because landscape design does not fear change, far from it: it works with the living and therefore thrives on disturbance; it knows that change is not an accidental but a substantial state, which is not to be feared, but understood and managed. In this sense, the landscape point of view and landscape architecture cease to be options and become necessities, not only for their interpretative, configurative and technical aspects, but also, and primarily, for their reasoning structure, for the conceptual tools with which they are able to tell the world and make the world. As such, they can instruct and guide both large-scale political and technical choices, as well as minimal actions, operating on several rhythmic and melodic lines that develop as in a score: the line of ecology and relations in the environment; that of social relations within contexts of dialogue; the political line, which defines values and objectives, nodes of consensus and conflict; and finally the aesthetic line, in a broad and inclusive sense of natural forms and phenomena.

7.3 THEMES AND EXPERIENCES OF THE PROJECT IN FRAGILE LANDSCAPES

In the following, to exemplify the attitudes and modalities of the landscape gaze and project, we refer to some fragilities that characterise the Italian territory extensively and that, in their manifestation, take on clear landscape evidence. These are places, situations and phenomena that are part of the habit of those who live in many parts of the peninsula, of those who travel along a large road or railway, cutting through, like a section, large portions of the territory, or that periodically show up in media images. We discuss isolated and abandoned rural buildings, in richer and more dynamic agricultural areas, and their fate in oblivion. We address the impoverishment and simplification of the agrarian landscape created by 'modernisation without development' (Sapelli, 2015), and possible new forms of agriculture compatible with people's lives and the quality of the environment. We consider water, too little in droughts or too much in floods, and the many possibilities it offers in rethinking regulation, security and the quality of spaces. Lastly, we deal with the widespread and chronic phenomenon of forest fires, which makes evident the abandonment and deterioration of forest quality and is linked to the loss of local knowledge of fire, its rules, and the times and ways of using ancient agronomic and forest management techniques. These situations exemplify, among many other possibilities, several opportunities for action that integrate widespread knowledge of landscape transformation processes with a shared awareness, where visibility and knowledge also mean operability. In other words, it is a question of bringing to a cultural and political level – that is, within the space of sharing public images and common visions – that which otherwise belongs only to the inevitability of events, to the widespread and fragmented perception of risks,[6] or to consolatory or consensual interpretations which are therefore inevitably reductionist.

7.3.1 The Ruins of Abandoned Landscapes: Composition and Recomposition

Travelling along an Italian motorway or railway, along the tracks that cut deep into agrarian landscapes, makes it possible to immediately grasp the widespread and indistinct phenomenon of the abandonment of the rural building heritage. The studies and research that for many years have documented

[6] For the relationship between risk perception and awareness and its implications in contemporary society, reference is made to the writings of Ulrich Beck (see Beck, 1992).

Italian rural architecture and the territorial rationality of settlements, starting with Pagano and Gambi's studies (Pagano, 1936; Gambi and Barbieri, 1980), are today the documentation of a largely lost past, of which photographs, reliefs, transformed simulacra or mere ruins remain (Bevilacqua, 2002). Recent data on territorial changes in Italy help us to place this phenomenon in the broad picture of the transformations of the last 60 years:[7] the subtraction of fertile soil for urban uses and infrastructures and the radical changes in agrarian practices, due to modes of conduction oriented towards increased and efficient production, have modified rural landscapes with consequences on land structure, agronomic quality and building stock, which has become progressively overabundant and inadequate. The phenomenon has affected the Italian territory more than others in Europe, and has left, as if after a flood, the abandoned remains of rural constructions in the plains and valley bottoms, and of inhabited areas and widespread settlements in the highlands.

Many recent readings and interpretations have extensively dealt with settlement abandonment, particularly in inland areas, especially from the perspective of creating renewed housing conditions linked to new policies and economies (De Rossi, 2018). These studies have also highlighted the technical and cartographic limits posed to the geographical and quantitative reading of the phenomenon at the minute scale, far from the main agglomerations or where recent superfluity of the territorial palimpsest has eliminated the strands of the 'thin and resistant' web (Bevilacqua, 2018) that, despite everything, in many parts of the Italian territory still sustains the system of rural territories.

At the tiny, close-up scale, which data and maps struggle to represent, one can in fact recognise the most fragile situations and artefacts. They are clusters of ruins, sometimes unrecognisable and reduced to piles of stones or dystopian groves of trees and shrubs in the agricultural desert of the plains. The landscape evidence of these situations anticipates analytical knowledge and poses urgent questions that cannot be answered by the search for a new meaning and possible reuse in relation to the past, nor, perhaps, in systemic and widespread actions: there are places where the residual materiality of things has lost and loses meaning every day. The artefact, or what remains of it, detaches itself from the meaning linked to use, memory, history, and requires a new point

[7] Reference is made to the data and analyses presented in ISPRA's report *Territorio. Processi e trasformazioni in Italia*, published in 2018 (https://www.isprambiente.gov.it/files2018/pubblicazioni/rapporti/Rapporto_territorio_web.pdf). The words 'metamorphosis', 'transition', 'transformation', often used in it, describe an inexorable process of extension and transformation of the built-up area and of endogenous mutation of the agricultural and forest land.

of view which moves from physical, geological and biological evidence, suspended between a lost and forgotten past and an open future.[8]

These situations without a memory require an approach placed in the here and now, beyond nostalgia and the poetics of ruins, as opposed to the 'anthropology of abandonment' that characterises, for example, Vito Teti's writings on the abandoned places of Calabria and aims to permanently rescue them from oblivion (Teti, 2004), as well as the poetics of Franco Arminio (Arminio and Ferretti, 2019). It is a matter of recognising and interpreting the extreme expression of the fragility of artefacts inherited from the past, which perish, leaving every vital cycle to return to the simple materiality of a heap of stones or soil, of waste and scrap.[9] It is a widespread, indistinct condition, perhaps more frequent in intermediate territories – that is, far from metropolitan dynamics and inland areas – but it can be found everywhere: in the countryside of intensive agriculture, where the proportion of buildings functional to activities and the extension of farms has led to the disuse of most rural artefacts; in the areas enclosed and rendered inaccessible by large infrastructures or by the subdivisions produced by new land uses, production and logistics areas, technological and energy plants; but also in the high lands of the Alps and the Apennines, far from the major centres, in alpine pastures and forests; in the landscapes of land reclamation and large agricultural estates.

These situations, in their extreme frailty, close to disappearance, suggest two possible scenarios. The first is the final abandonment, ruin and dissolution of the artefacts, absorbed by the geology and the physical and biological cycles of the landscape; it is an accepted option, and one that brings back into the ecological cycle what pre-existed, considering and acknowledging the environmental risk that this may entail, and ultimately entrusting the object to the world of forgotten things (Schalansky, 2018). On the other hand, the second scenario calls for the careful storage and recomposition of what was built in the past (Lynch, 1991), through a sort of temporary takeover, 'an act of stone towards a civilisation that ended the day before yesterday, the final phase of a parable that, however, also wants to suggest the beginning of a new

[8] The theme of reuse, recycling and waste was dealt with in a large Project of Significant National Interest coordinated by Renato Bocchi between 2012 and 2015 with Istituto Universitario di Architettura di Venezia (IUAV), Università di Trento, Politecnico di Milano, Politecnico di Torino, and the Universities of Genova, Roma La Sapienza, Federico II in Naples, Palermo, Reggio Calabria, Chieti and Pescara, Camerino. In particular, on the subject of waste and the new and unexpected evidence in the landscape, see the contribution by Carlo Gasparrini (2014).

[9] For the concept of waste in relation to the processes of decay and change of meaning, as well as with respect to the possibilities of reintroduction into urban life cycles, or care in storing what has been collected and used, a fundamental reference is the papers by Kevin Lynch collected by Michael Soutwork (Lynch, 1991).

era' (Dini-Girodo, 2020, p. 79). With these words, Ticino architect Martino Pedrozzi describes a set of 'recomposition' actions in the alpine pastures of the Malvaglia Valley, in Ticino. They are minimal interventions, tackled in an area dominated by the backdrop of the Alps and not immune to the phenomena of abandonment, of the decline into invisibility of minor artefacts, despite the many resources dedicated to the recovery and conservation of rural landscapes allocated by the Swiss confederation through regional policies. In abandoned alpine pastures, small buildings built of stone, with wooden beam ceilings, have collapsed, losing their original form and function. After a process of decomposition, what remains is slowly reassembled, collecting the stones and placing them within the original footprint, bridging a gap or even just the boundary defined by what remains of the wall perimeter. The interest and significance of the operation lie in the process it involves, in the rituality and the manner of the action rather than in the formal, discreet and almost invisible result, or in the undoubted landscape quality of the place where it takes place. Deconstructing and moving stones implies direct knowledge of their conformation, their weight, their arrangement with each other. It is a long and patient task that Pedrozzi initially carried out alone or with little help, later involving groups of students and volunteers. From waste, each stone acquires a new meaning when, taken in one's hands, it is weighed, observed in its form, understood in its constructive possibilities: a fragment of wall, a coping, a flat slab. The stones are reassembled to form perimeters, fills, finally a flat surface that encloses the structure. Disassembly, which is also a way of getting to know the elements of the artefact, is then followed by its recomposition into new forms. Simple plans describe the imprint and mark the persistence in the landscape of what has been an animal shelter, a barn, a dwelling. The action takes place without any need to refer to the use of the buildings to which the stones themselves belonged. It simply takes place in a space, occupying it with a new, durable artefact, which regains meaning in relation to its surroundings, reconstructing new relationships in an open manner.

The design actions experimented by Martino Pedrozzi are circumscribed in time: a few summer weeks dedicated to the care of a place, a didactic workshop with a group of university students from architecture schools.[10] They enter and leave, discreetly, the long time of the landscape and the transformation of artefacts; they produce an acceleration, an intentional change, an interference represented by a minimal and probably temporary principle of order. Without an excessive economic investment, this leaves the place with a new conforma-

[10] The workshop experience is documented in the video *Essere felici*. *A Martino Pedrozzi's Recomposition with USI, EPFL and ETH* (https://vimeo.com/545850255).

tion, different from the past, but also open to subsequent evolutions. As Michal Jakob writes in a lengthy commentary on Pedrozzi's work:

> The work reflects ... an ecological process (having rearranged a site with minimal effort and environmental impact), an aesthetic process (having created a new, partly mysterious form), a social process (having worked together with a diverse group without any hierarchies) and also a political process, since such an activity nevertheless serves as a public manifesto. (Jacob, 2021, p. 5)

The value of the action is evidently symbolic and thus lends itself to being deployed in other situations and at different scales. We can imagine such a mode of operation transposed to the agricultural landscapes of the plains, to the margins of suburbs in large metropolitan areas, to the floodplain areas of rivers. A roofless building is completely invaded by the vegetation inside it, a new space inhabited by nature becomes a small heart of naturalness and biodiversity in the agricultural desert. The mere permanence of a void, a clearing, or a set of brambles grown over an expanse of bricks, produces a discontinuity in the forest, favouring the filtering of light. A wall perimeter, together with many similar wall perimeters, defines a rhythm, a sequence of references for those travelling at speed along a motorway or railway route, or a garden and a point of shade for those moving slowly across the landscape.

7.3.2 Simplification and New Complexity of the Agrarian Landscape

In agricultural spaces, a form of fragilisation is evident that is the 'other side' of the soil consumption produced by urban growth and measured every year by Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA) reports:[11] it is extensive, progressive, devious, because it occurs in the continuity of the agricultural economy. In different ways, modern agricultural management has in fact led to the impoverishment of the agrarian landscape, the amalgamation of land, a reduction in landscape complexity and biodiversity, with significant environmental damage. The soil is thus increasingly weakened before it is consumed, through slow and progressive changes that escape the evidence of perception and originate in the global processes of agricultural modernisation of the past century. The effects on the environment of mechanisation and, since the 1940s, of the 'Green Revolution', are well known and highly debated (Carson, 1962; Shiva, 1993; Bocchi, 2015); without these advances,

[11] ISPRA annually collects data on soil consumption, supplemented in recent years by an in-depth study on the effects on ecosystem services. Documentation and annual reports can be found at www.isprambiente.gov.it/it/attivita/suolo-e-territorio/suolo/il-consumo-di-suolo/i-dati-sul-consumo-di-suolo.

much of the world would not have had access to the prospect of development, but with serious consequences for the environment and living and working conditions.[12] The dust storms in the central American states between the 1920s and 1930s – recounted by John Steinbeck in *The Grapes of Wrath* – which led to the abandonment of large territories and mass migrations, were caused by the transformation of large prairies into arable monocultures, deep ploughing and the use of industrial fertilisers, combined with the lack of rainfall, the loss of organic matter and, finally, the pulverisation of soil. These phenomena, together with the aggressive growth of urban and agricultural settlements, led some agronomists and foresters, such as Herbert Hanson and Aldo Leopold, to write the first scientific and civilised texts on the relationship between agriculture and the environment, proposing a new conservative and ecological attitude towards a different kind of agriculture, respecting the Earth's resources and their reproduction, with constant attention to the landscape, understood as the interaction between human action and wildlife (Hanson, 1939; Leopold, 1949; Wezel et al., 2009).

In Italy, the results of industrial agriculture – in the monocultures of the plains, in the landscapes of wine, hazelnuts, intensive horticulture and fruit-growing – are less drastic, yet relevant: soil pollution and impoverishment, improper water management, loss of biodiversity, of tree cover, hedgerows and woodland areas, functional to wind protection and pollination. The widespread perception and awareness of these phenomena mainly concern environmental aspects, while the consequences and evidence of the landscape remain on a blurred background or fragmented in partial images, a reflection of social fragmentation, expectations and local interests.[13] The Italian agricultural territory is an extension inhabited and cared for by over 1 million workers, a number that does not take into account the many irregular seasonal workers, in conditions of absolute precariousness.[14] The agricultural and livestock sectors are regulated and supported by European policies that commit one-third of the European Union's resources, and that for Italy alone correspond to 15 per cent of the total, amounting to over €7 billion per year. If the urbanised area in Italy measures 21 500 square kilometres, with an average annual growth rate over

[12] The United Nations Food and Agriculture Organization (FAO) reports annually on the analysis and monitoring of the condition of agriculture and food systems in the world (https://www.fao.org/sustainability/en/).

[13] On the environmental conflicts related to agricultural activities and, more generally, on the environmental and social sustainability of Italian agriculture, take a look at the documentary and information activity conducted by the Forum nazionale salviamo il paesaggio (www.salviamoilpaesaggio.it).

[14] The number of agricultural workers in Italy, including seasonal workers, is 1 088 034 (EBAN Nomisma 2022 data).

the last ten years of between 6 and 7 per cent, agricultural areas occupy 164 000 square kilometres of farmland, with 415 000 enterprises, against 128 000 square kilometres of utilised agricultural area (UAA), that is, the part directly cultivated, net of woods, buildings, rural infrastructure.[15] This area is managed by increasingly structured tenant farms, but of limited size: on average they measure 18 hectares, a size that has doubled in the last 20 years, mainly due to the amalgamation in management between owned and leased areas. Only 1.6 per cent of Italian farms exceed 100 hectares of cultivated land, a figure that does not reflect the ownership structure, which sees large tracts of private and public ownership, especially in areas with a stronger agricultural economy.

Agriculture represents an extraordinary area, only partly practised, of policies and actions to reorient development,[16] restoring the landscape point of view and the landscape project to a central role with widespread effects in all territories, including the most intensely inhabited ones. In fact, the spaces of agriculture in Italy, in their territorial differentiation and extension, represent the palimpsest and living matrix of the landscape – described by Sereni in the post-war period starting from iconography, and before that by Stoppani, integrating geography, history and society, geology and natural sciences of the Bel Paese in a great pedagogical tale (Sereni, 1961; Stoppani, 1876) – and are a constantly changing context, as well as a field of power and policies, which should be integrated between agriculture and culture, environment, society and work, inseparable aspects in a living and working landscape perspective.[17] This can happen provided that the spaces of agriculture are not seen as a space for sectoral economies and policies, but as a laboratory for a new ecological and landscape quality pursued in a collective and shared manner.

For this to happen, two conditions are needed, which are not new in the history of landscape design: a broad, strategic vision, projected in the long

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[15] ISPRA data 2021, *Consumo di suolo. Dinamiche territoriali e servizi ecosistemici. SNPA 32-2022*. For information on the changes in agricultural areas in Italy, farm management and farm types, see the summary report of the Seventh General Census of Agriculture, www.istat.it/it/files//2022/06/REPORT-CENSIAGRI_2021-def.pdf.

[16] For an overview of 2023/27 European agricultural policies and the potential limits of their implementation see Sotte (2021). As of 2023, funding and projects are no longer managed, as in the past, by the regions, but by the government on the basis of a national strategic development plan. The choices brought about by the pandemic and the new policies aimed at sustainability, through the New Green Deal, have led to a reorientation of investments towards curbing emissions and increasing biodiversity, with significant divergences between the objectives and the reality of national actions.

[17] It should be kept in mind that the number of actors and decision-makers involved, in relation to the size of the territories involved, is not comparable to other contexts and policies capable of producing direct effects and modifications on the landscape, such as construction, infrastructure, tourism.

term; and a profound and spatially defined relationship, circumscribed in a near time horizon, with a place and with a set of possible modifications in the negotiation between natural dynamics, productive and economic objectives, health and wellbeing of communities.

If these two conditions coexist, the landscape can be the context of integrated actions, which take place in precise places and which over time can extend and replicate themselves, on the basis of workshops of a local nature, of agreements, pacts, consortia as widely described and practised by studies of a territorialist matrix since the 1990s (Magnaghi, 2020; Magnaghi and Fanfani, 2010; Ferraresi, 1993). The experience of agricultural districts, often governed and mediated by parks, moves in this direction. But even some more independent and isolated experiences have shown how the diffusion of a project culture in the landscape, combined with the opportunities offered by rules and funding, can be very effective and trigger reform processes, often starting precisely from certain fragile conditions. Farm experiences that integrate production, environmental and landscape aspects in relation to the local impacts of agricultural changes are also beginning to move in this direction, particularly where these affect the health and daily life of communities.

An example is the experience of the Cassinazza private farm, which operates on more than 1500 hectares of arable land in the irrigated plain between Milan and Pavia,[18] close to the Pavia Canal, just beyond the limits of Milan's Southern Agricultural Park. Faced with tumultuous urban growth, which began in the post-war period and has not stopped (Balducci et al., 2016), since the early 1970s various actions to protect natural and agricultural areas – the outcome of important political battles – have led to the establishment by the Region of the Ticino, Adda and Groane parks, the Parco Nord, and since 1990, the Parco Agricolo Sud Milano (Ferraresi, 1993; Beltrame, 2000); but often without being able to act on the preservation of the landscape structure that evolved in the direction of monoculture, supported by European Union measures, and in the substantial freedom of companies owning or renting large estates, public bodies and foundations. The progressive outcome was the loss of the agrarian landscape not only as a structure of fields, irrigation systems, trees and agricultural diversification, but also as an image present in the daily life and memory of the citizens of the Milanese metropolis, which became a 'city without landscape' (Longo, 2017).[19]

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[18] The Cassinazza experience is documented on the website www.reterurale.it/ as well as through numerous journalistic contributions, including Caprara (2021). The data and information in this chapter are derived from direct sources and from what can be found on the company website.

[19] Comparison of land-use data shows that the system of hedgerows and trees between farms that developed alongside the dense irrigation system has been almost

In this context, among the enterprises in southern Milan, the Cassinazza farm represents an anomaly and an interesting and well-established experiment. The anomaly consists of several aspects: the functional specificity of the company, which integrates industrial activities of special waste management and agricultural activities; the size of the farm, the result of the capitalisation of the two activities, at least ten times larger than the average of South Milan companies; the choice of a regeneration process that has made tactical use of European Union funds, rules for agronomic management, and opportunities of the differentiated local market which is also willing to pay the increased value of quality products, such as the Milanese market; finally, in deliberately allowing the invention of a new landscape, which marks a departure from past history, an island of biodiversity in the agricultural desert of South Milan, excluded from public use. The farm has allocated part of the surface area (about 20 per cent of the UAA) to the creation, over time, of wetlands and woodland areas,[20] and to the formation of a network of canals, whose section has been modified and widened to favour the function of irrigation by overflowing, accompanied by strips of hygrophilous vegetation. This condition has produced an increase in the presence of insects antagonistic to the harmful species, such that the need for insecticides has been cancelled out and the use of plant protection products has been limited to anti-fungals.

The relevant aspect of the Cassinazza farm is to have placed alongside its typical agricultural activity a focus on environmental aspects, to the point of considering the environment itself an agricultural product, with obvious advantages in both ecological and agronomic terms. The initial instrument was the use of European Union and regional funds for the creation of wetlands and woodland bands functional to agricultural management with a 20-year horizon; moreover with a prospect of reversibility permitted by the regulations themselves. Built over time, today the ecological-environmental infrastructure of the farm represents part of the value, image and the current economy, and more than 20 years after its start-up, the farm represents a possible future evolution of agricultural areas in the Milanese metropolitan area and, more generally,

completely lost between the post-war period and the present day, with a significant acceleration in the last 30 years. Dimple springs, surface aquifer gaining streams and water meadows have also been almost completely lost. The dominance of maize and soybean crops, partly replaced by dry crops in the face of a reduction in irrigated meadows and flooded rice fields, has changed the use of water resources for irrigation, creating imbalances in the demand-to-availability ratio, with dramatic consequences in the management of emergency conditions, as in the summer of 2022.

[20] The farm had access to €2 million in Community Agricultural Policy (CAP) greening funding and Rural Development Plan funds. The farm's natural area system today consists of 78 hectares of woods and permanent meadows, and over 100 hectares of wetlands.

in the territories of intensive agricultural production, flanking and integrating three different types of spaces. First, spaces dedicated almost exclusively to biodiversity, which support agronomic quality by improving water quality, the presence of insect and vertebrate species, protection from the wind, and so on, and provide a broad set of ecosystem functions. Second, agricultural spaces, still managed according to principles of farm efficiency, but with management methods based on agroecological principles aimed at quality production, crop sustainability and the creation of food chains. And third, spaces that are usable, traversable, open and available to those who inhabit the territories. There is no shortage of limitations and shortcomings, such as the excessive closure and protection with respect to the surrounding territory, or the abandonment of many beautiful rural buildings and farmsteads: destined for ruin, perhaps waiting for new uses.

In this sense, the Cassinazza experience recounts and explicates a framework of possibilities that can be generalised and is certainly already present in many areas in Italy. The question is how to handle the potential and fragility described so far with an attitude of contextual imagination that brings agroecological practices very close to those of landscape architecture:

> the essential vision of agroecology … the agroecological imagination – is to think contextually. Instead of doing the same in different places and the same in the same places, agroecology works by trying to do different things in different places through localization of knowledge, food, region, and more. And agroecology also works by doing different things in the same place, for example through crop rotation, crop and livestock integration, diversification, considering the farm as a home and a community, provision of habitat, and other forms of multifunctionality. (Bell and Bellon, 2018, p. 610)

7.3.3 The Water Landscape: Excess and Scarcity

Water is at the basis of the settlement principles of many areas inhabited by human beings, and the way in which its presence or absence is managed has often been decisive in defining the very location of a city itself: it is well known that the first urban settlements developed at the height of springs, not too far from ridges, and close to places where water could be drawn for domestic use, for crops and livestock. It was only later that cities took possession of the valleys, which required a high level of technical and political development, the kind that makes it possible to reclaim marshes, defend against floods, build bridges, canals and drainage systems, and combat waterlogging. Without water, therefore, the city is unimaginable, and at the same time, living with water requires advanced skills. The relationship with water is also decisive in defining the shape of cities, to the point that it is possible to subdivide them into concave, convex or plain, precisely according to the ways in which they

interact with water, both spring and meteoric (Laureano, 2013). It is no coincidence, for example, that lowland cities have historically developed forms that can be traced back to grids, exploiting the same isotropic geometric principle adopted for the drainage of extensive horizontal surfaces, where water tends to be stagnant because there is no slope that determines a prevailing direction of flow. In the same way, convex cities are typically developed on terracing, not only to make sloping surfaces partially horizontal and thus suitable for both construction and cultivation, but also, in the absence of springs of sufficient capacity, to be able to channel water into channels that, by exploiting gravity, allow the water to be stored in cisterns, intercepting at least part of its downward flow, which otherwise causes it to drain away without being available when needed.

The examples are innumerable; indeed, it may be considered that every urban matter is inevitably also a water matter. The topological and geometric correspondence between city and water has gradually become less and less clear with the strong acceleration of technological developments (at least from the industrial age onwards), generating disagreements that have gradually made water a dangerous element to be quelled with coercive measures. It is no coincidence that the season of the systematic construction of embankment walls in the main Italian cities crossed by rivers of a certain significance is placed for all of them in the same period, between the last decades of the 19th century and the early 20th century, when faith in technology capable of taming the impetuosity of nature was stronger than ever.

Unusual weather phenomena, a side effect of climate change, are increasingly demonstrating the inadequacy of interventions that have replaced the instability and thus the fragility of water territories, with the robustness of devices aimed at harnessing it with the pretence of taming it and leading it to a constant and unalterable condition that does not belong to it. In doing so, we have on the contrary exasperated the extremes of its fluctuating behaviour, linked to its excesses of temperament (floods, flash floods, storm surges) and its absence (droughts). Data collected by Legambiente's Osservatorio Città Clima reveal that 310 extreme weather events occurred in Italy in 2022, a 55 per cent increase over 2021. Of these, 117 were related to floods from heavy rains and river overflows, with a percentage increase of 19 per cent compared to the previous year; and 28 to prolonged drought,[21] in this case with a per-

[21] According to data from Istituto di Scienze dell'Atmosfera e del Clima del Centro Nazionale Ricerche (ISAC-CNR), rainfall in the first seven months of the year fell by 46% compared to the average of the last 30 years. The first part of the year was crucial, with five consecutive months of severe drought, and an anomaly of –44% rainfall from January to June, equivalent to about 35 billion cubic metres less water than normal ... In increasing difficulty were the rivers, such as the Po,

centage increase of 367 per cent compared to 2021. The management of water resources is therefore nowadays an inescapable mandate for any urban project, of any scale and tenor, and must be addressed simultaneously to the two phenomena, the flooding and the drought, since they have demonstrated equal severity, albeit with completely different manifestations: the former is sudden; the latter is gradual and progressive but no less devastating. This is why any landscape project is inevitably a water project, conceived as a turning cog in a dialogue with water, its chemical and mechanical qualities, as well as with its motions. It is only a question of renewing the 1000-year-old practice evoked earlier that wanted the reasons for the position and form of urban space to emanate from a structuring bond with water; it is necessary to imagine places that, in addition to being successful, accessible, functional and appealing public spaces, as well as efficient and sustainable productive spaces, are also hydraulic machines capable of directing and containing water, both to slow down its flow and reduce sewer overload in cases of particular abundance, and to store adequate quantities in anticipation of possible droughts.

There are countries to look to for their avant-garde positions: in Europe undoubtedly the Netherlands, and then the United States, where the design of water landscapes has long converged on strategies and methods oriented towards collaboration with the water behaviour of rivers, rainfall and tides, having abandoned the long-prevailing attitude of containing bodies of water within places, forms and devices not appropriate to its mode of action. However, some recent experiences comfort us in the knowledge that a design capable of negotiating with water, in forms of skilful and far-sighted mediation, is practised in Italy and can be a replicable reference, of method and solutions. This is the case of several projects by Studio Ceccon Zampieri, which introduce reflection on the ways of negotiating and non-hostile coexistence with water within contemporary public space arrangements. This is the case, for example, in Mestre, in the park of Via Mattuglie alla Gazzera, where areas that are marshy by nature are preserved in their hydraulic functioning and enhanced aesthetically, literally staging the ways in which water draws surviving passages of territories that once belonged to it entirely. This is also the case of the Parco Catene, in Marghera (Venice), built in 2012 in an agricultural fragment of about 8 hectares. The project recovers and renews the function of a series of hydraulic devices that have long been present on the site, long used for agricultural purposes, including *baulatura* (traditional convex shaping of

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> which at Ponte della Becca (Pavia) had a water level of –3 metres, and the large lakes, with filling percentages ranging from 15% of Lake Iseo, 18% of Lake Como to 24% of Lake Maggiore ... Lake Trasimeno reached a level well below the critical threshold, at -1.54 metres. In Latium, Lake Bracciano has dropped to –1.38 metres from its hydrometric zero. (Legambiente, 2022, p. 2)

land), drainage canals and main drains for water disposal, as well as approximately 6000 square metres of wet meadows, which allow the maintenance of the hydraulic regime and invariance of the area, conditioning the quantity and location of the sealed areas. On the surface of the area, incisions, corrugations, elevations, stresses, consolidations have been made, which respond to multiple criteria: they enhance the physical properties of the different soils; they condition the movements of users by suggesting perceptive directions; they make the hydraulic system efficient. These are not only drainage channels, but also drainage channels combined with underlying micro-perforated pipes which, by draining the lawn surfaces, ensure the water supply to a rainwater collection tank which in turn feeds the irrigation system, consisting of two circuits, one for the new trees, the other for sprinkling the lawns. It is therefore a system that works with opposing water regimes, directing excess water in the event of exceptionally heavy rainfall, and channelling water into special reserves in anticipation of drought periods.

What is striking about these projects is their ordinariness. They are not striking actions or muscular transformations, but rather a subtle, minute and pervasive work that innervates everyday landscapes, recovering their sense and efficacy, as much functional as identity and, not least, aesthetic. These are minor projects (Boano, 2021) that have the capacity to become structuring, and if they really became systematic practices, would be able to make decisive contributions to tackling the hydraulic fragility of our landscapes, even avoiding isolated and lavish works, in terms of dimensional, technological and financial tenor. These projects express not only the technical skill of knowing how to manoeuvre water territories without forcing, and with the necessary smoothness that knows how to transform their fragility into a qualifying character, but also the ability not to subordinate the sense of the project to the deaf application of textbook solutions – 'rain gardens', 'sponge parks', 'concave structures', 'retention tanks', 'dry canals' or 'grassed waterways' – which risk conforming to urban landscapes by resorting to a sampler of environmentally effective devices, but which, without the necessary rootedness in the physical and symbolic, material and immaterial characteristics of the contexts of reference, risk transforming the 'water-sensitive project' into an atopic and technocratic universalism, replacing environmental and spatial fragility with weakness of meaning and value.

7.3.4 Fire as Part of Landscape Development

Fires are an increasingly looming threat to our territories, and surveys reveal increasingly alarming phenomena. According to the most recent European Union report at the time of writing (San-Miguel-Ayanz et al., 2022), 2022 was the year with the greatest number and spread of fires since 2006, having

affected areas totalling 8600 square kilometres. It is no coincidence that 2022 was also the year with the most serious water crisis in Europe in the last five centuries: climate change, in fact, with rising temperatures and the prolongation of drought periods over increasingly large areas, are among the reasons triggering fire outbreaks. Other causes, no less significant, are the inadequate management of forests and agricultural areas, and the consequent development of environmental conditions favourable to the development of sudden fires that are difficult to manage. Italy is among the European countries most exposed to the risk of fires. In 2021, it held the continental record for the extension of areas on fire, amounting to almost 152 000 square kilometres, a 234 per cent increase over the national average of the previous decade (San-Miguel-Ayanz et al., 2022). These numbers paint an extremely grave picture, the causes of which are only partly attributable to endogenous phenomena or arson: the main cause is deliberate fires that are beyond the control of untrained people.

And yet, paradoxical as it may seem, fire is fire's worst enemy, as is well known to humans who have lived in territories exposed to its risks from very distant times, from the Mediterranean to California to Australia, and who have developed traditional practices of controlled, selective, localised and low-intensity fires. The reason is that these fires, if well managed, have advantages. For example, they sort the vegetation, clearing out that which easily catches fire, and making room for that which can withstand exposure to flames (a typical feature, in Italy, of many tree and shrub species of the Mediterranean maquis shrubland), thus helping to reduce the combustible load and restore altered or dysfunctional ecosystems. Another advantage is that they trigger vegetative successions, creating the conditions for soil renewal and the germination of latent species. In fact, fire is often considered a devastating element, but it is also an opportunity for rebirth: through fires, trees are carbonised, mineralised and then reborn, and many plant species, namely pyrophylous, can only carry out their life cycle after the fire has passed[22] (Clément, 2005), in turn contributing to the reinvigoration of soil quality. In different ways, these populations resorted to controlled fires to strengthen local ecosystems and reduce the risks of destructive fires developing beyond their control; in other words, they knew how to fight fire with fire. These methods of land management were once widespread in Italy as well. For example, in the Tavoliere, in Apulia, and in the areas bordering Daunia and Irpinia, the practice of controlled fires after the wheat had been harvested gave rise to the custom of

[22] London rocket (*Sisymbrium irio*) is, for example, one of these plants; it owes its name and notoriety to one of the most devastating urban fires in Europe, the Great Fire of London in 1666: the city was reduced to rubble, and it is said that in a short time the remains were covered by a myriad of small yellow flowers, which then became the symbol of the city's rebirth (Clapham et al., 1968).

harvesting the residual burnt ears of grain; from these came the burnt wheat flour with which traditional fresh pasta was made; the burning of the fields was also a biological stimulus to the development of wild rocket[23] (*Diplotaxis tenuifolia*), an edible herb, an integral part of the local diet, to the harvesting of which time and attention was devoted. On late summer nights, the fire traced blazing lines in the landscape, of a deep orange colour, which emphasised the ruthless horizontality or the slight undulations of the terrain, in a ritual whose power, of danger and at the same time of regeneration, was perceived; in the following weeks, the fields appeared as if tattooed by the controlled passage of the flames, which had drawn them according to trajectories aware of the directions and intensities of the winds, in an intertwined choreography of air and ground; magnificently portrayed, for example, by the eyes of the Italian photographer Mario Giacomelli.

These practices have been largely lost, partly because of the 'culture of removal' that in Italy, and in many other countries, has sought to make social and economic redemption coincide with the overcoming of agriculture, pastoralism and harvesting, considered the embodiment of millennia of poverty and oppression. But the loss of this knowledge, in addition to causing a serious impoverishment of the local cultural heritage, also leads to the abandonment of crops and forests, producing intermediate areas of vegetation that constitute an enormous and dangerous combustible load, especially in light of the variations in rainfall patterns and temperatures, previously mentioned.

Instead, these skills could be renewed and relaunched as contemporary landscape design tools, within the framework of what has been called 'pyrological design' (Schuler, 2020). Examples are not lacking, especially in the United States, involving some of the most influential designers on the international scene. This is the case of Michael Van Valkenburgh (MVVA) who, exactly 30 years after the pioneering experience of the General Mills Sculpture Garden in Minneapolis, in which fires were an integral part of the garden's prairie management plan, included the practice of controlled fires among the planned actions of the master plan for the Turkey Mountain Urban Wilderness Area, extended over more than 250 hectares, not far from Tulsa, Oklahoma. For a long time, especially in pre-colonial times, the local landscape was governed through controlled fires (pyro-silviculture), generating the complex mosaic of forests, glades and high, open grasslands that has long characterised it. But with the cessation of these practices, it has become a dense blanket of trees, largely of species not suited to resist fire, triggering a potentially huge risk of disastrous fires. Aware of this environmental, biological and cultural history,

[23] Wild rocket belongs to the botanical family Brassicaceae, like London rocket, mentioned in the previous footnote.

MVVA reintroduced low-intensity induced fires as a landscape design tool, dividing the area into 120 geographical units to be burnt in a progressive sequence. The project has been advised by experts, who in turn have trained competent operators who have been entrusted with the management of the park over time, since – as noted above – the practice of controlled fires requires specific preparation and cannot be improvised. Launched in 2021, the fires will be continued on an experimental basis for the next five years, with positive effects expected in terms of increasing biodiversity and containing uncontrolled fires.

Fire management goes hand in hand with land management, and these practices show that fire prevention coincides with the activation of virtuous cycles, both ecological and economic, as well as affective, of care, memory and rootedness. In line with the requirements of European Union directives (Nuijten et al., 2021), Italy too is equipping itself with prevention programmes[24] that find in pyro-silviculture a resource for containing risks and improving environmental conditions, as already takes place in a structured manner in other European countries.[25] It cannot be considered an isolated practice, as it is part of an integrated system in which other operational plans collaborate, from pastures to the management of public spaces. The hope is that, similarly to what has happened with water, a custom of collaboration and 'complicity' can also be established with fire, which can lead to 'fire-sensitive projects', introducing a repertoire of possibilities for entering into a relationship with an element that is certainly dangerous and, just like water, capable of bringing destruction but also fertility, meaning and beauty.

7.4 IN FRAGILITY: LANDSCAPE AS A FIELD OF DESIGN

From the themes and experiences described, it can be understood how the landscape point of view precedes and accompanies the operative and technical dimension of landscape, the design of which is in turn a matter of tension;

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[24] The main funding system for prevention interventions in Italy is the European Commission's Rural Development Programme (RDP). Regulation (EU) 1305/2013 re-proposed direct support for interventions to prevent damage caused to forests by fire (Sub-measure 8.3) and to restore forests damaged by fire (8.4) for the 2013–2022 EU programming period (extended until 2022).

[25] Examples include the Swedish LIFE Taiga project, funded by the European Union and the Swedish Environmental Protection Agency with a budget of almost €10 million over five years (2015–2019), under which approximately 120 controlled fires were conducted in Natura 2000 sites, with the objectives of restoring and conserving unique habitats; and the Spanish TREX Andalucía 2019 project, a collaboration between the Andalusian government and the United States-based Nature Conservancy, to train specialised personnel in the management of controlled fires.

today, more than ever, open to the need for an epistemological interrogation of its meaning, its methods and its tools, precisely in the light of the renewed awareness of the unfailingly performative nature of landscape (Jullien, 2014).

Since the landscape acts and, as has been referred to, is a subject as well as an object, it should be observed and handled from an ethological perspective, thus addressing the behaviour of its constituent elements (Corner and Hirsch, 2014; Mathur and da Cunha, 2009). To acknowledge that the landscape is a plural subject endowed with agency might lead one to think that it is outside the possibility of the project, placing itself outside the decisions and forecasts attributable to the wills that inform the competences of prefiguration and configuration. In other words, arguing that landscape is a subject could trigger the misunderstanding that it belongs to the sphere of operativity and not operability, understanding the former as endogenous action and the latter as heterodirected action. It could lead one to think that landscape is not plannable, because it is not a system of relations and situations that can be controlled, neither on a perceptual nor on a performative level.

In reality, if designing the landscape might seem a paradox, it is rather a matter of reformulating and welcoming a much broader, collective, open meaning of the project itself. In fact, it is not the landscape that must be removed from the sphere of the project, with an action of withdrawal that is as contrite as it is, at times, opportunistic (Sarkis, 2021), but it is the project that must be redefined in the light of the awareness of the partial but decisive indeterminability of the landscape. Understanding the landscape as a system of multiple agencies and as a situation open to occurrence does not therefore mean that it cannot be designed, but rather that it requires us to update our idea of the project, to rethink the terms, modes and objectives of the project with respect to the exercise of predictive and performance control and, if possible, redemptive control that modernity has elaborated and handed down. Recognising landscape both as an operable field which constructs and shapes itself, and as an operable field which can be constructed and shaped, the contemporary landscape project is redefined as a collaborative co-action, in dialectic between different skills and wills. It is a perspective that in its own way overcomes, reforming it, the traditional tensional field that for a long time has understood the landscape project as a triangulation between territories, architectures and devices,[26] and that finds in acting with the landscape

[26] The tension that has long defined the themes and objects of landscape design in the Italian tradition can be schematically described as lying between three vertices:

- Landscape as territory, that is, the symbolic forms between utopian representations (such as the idealisation of de facto lost historical landscapes) and the arrangement of atypical objects (the invention of new, unexpected composite landscapes).

(Celestini, 2018; Metta, 2022) a pertinent and effective synthesis with respect to the questions posed by territorial fragilities.

Understood in this way, the project takes the form of conscious and competent actions, sometimes in the form of extensive modification interventions, at other times of extremely minute interventions with respect to the dimension of the phenomena with which they are confronted in terms of scale, yet capable of triggering modifications with relevant effects, in terms of evidence and extent and significance. Regardless of the scale, these are in any case systemic projects that engage with the context and interpret it (McHarg, 1969), since they aim to interfere with the processual connections at the basis of the form and physiology of territories to obtain effects that, despite their duration, act in depth and know how to be structural.

From here, and with direct reference to the relationship between landscape design and territorial fragilities, derives the need to reiterate that landscape design is not a reassuring or consoling practice of remedy, but that its effectiveness lies in its ability to operate according to imperfect and incomplete systems, establishing physiological and not merely formal relationships with contexts.

The insights and cases presented in this chapter, along with some of the most interesting experiences of recent landscape projects, are not calming thaumaturgical devices, but are often a conscious destabilising practice, through the intentional triggering of disturbances or alterations, in the manner of a homeopathic therapy. Sometimes projects can limit themselves to physiological components, they let water and seeds spontaneously fertilise the soil, they draw with mud the bed of a river so that it can be modelled by flowing water, with new banks and canals they give shape and life to wet ecosystems where there was previously an industrial monoculture. Thus some of the landscape architecture experiences of recent decades are proposed as the determination of intentionally fragile states and arrangements, if by fragility is meant instability and fickleness, delicacy and transience, even disappearance and loss. These are projects that propose themselves as triggers of situations available for rewriting, modification, even cancellation as a result of complicit interaction with other forces and other actions, which may manifest or remain latent, may occur in predictable ways and times, or be sudden, or even never occur.

- Landscape as architecture, with the arrangement of new objects and the creation of new recognisable forms in the landscape, self-referenced and independent (the monuments) or the design of the ground.
- Landscape as a device in space or field of operation, project space in and for landscape, object and circumstance that accommodates relationships (remaining identifiable and recognisable, such as the many viewpoints, bridges, paths, benches) or becoming invisible in relationships.

These actions interrogate the alleviating categories with which we have learnt to describe the world we like, well-ordered, disciplined, and therefore static, with a constant arrangement, performing well to our use and consumption, locked in time by a misunderstanding of preservation.

This vision leads to the unravelling of a series of categories that have long informed the discourse on landscape design, derived from oppositional pairs that have typically contrasted what is spontaneous with what is designed, what is natural with what is artificial, what is human with what is, in fact, nature. These are distinctions that easily lose their meaning and usefulness if placed in the perspective of landscape as a performative sphere and subject, and landscape design as a mode of co-action.

This view may also lead us to reconsider some deep-rooted beliefs, for instance those that would have technique and aesthetics as fields of exclusive human relevance and competence, features of the superiority of humans over other living forms. On the contrary, it has long been demonstrated that other animals make use of tools to modify their habitats (Beck, 1980), and that many forms of multispecies symbiosis are based on choices of taste, to the point of being able to argue that what we insist on calling nature is nothing more than a sort of 2000-year event set up by all species for the pleasure of others, and that this pleasure is beneficial to all (Coccia, 2020). These are statements that could sound like attempts to delegitimise the project, to deny the technical and expressive responsibilities that have always connoted it. Far from it. It is a matter of reaffirming them, because it is on the development of technique and aesthetics that the construction of the world is based, to the point that they are also present in spheres of non-human existence, and of broadening their sense and spectrum, even amplifying their tenor of merit and responsibility. Understanding the project as the definition of the conditions for happening means having a profound and working knowledge of contextual situations and the ways in which other technical and aesthetic forms are active in them and, again, what effects can be generated by reciprocal interferences. There is nothing fatalistic or defeatist about this. Instead, it is a matter of reformulating the idea of the landscape project, of what it means, what categories it requires to introduce, what tools it should be equipped with to move towards the effects it intends to pursue, within a collective vision that includes the many agents that must inevitably be involved in the construction of complex and shared habitats. In this sense, the landscape project presents itself as an extremely fertile field of experimentation for renewing the status of the various disciplines that converge in the composition of the project culture of our time. To definitively place the concept of landscape in this operative meaning implies a rejoining of the mandates and tools of the project *tout court*, where the landscape project gives itself as a paradigm for a capacious reflection on the very

idea of the project in a broad and general sense, as an effective method option beyond the thematic pertinence of its own disciplinary field.

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8. Antifragile architecture: under what conditions is an architectural project antifragile?

Stefano Guidarini

8.1 INTRODUCTION

This chapter examines the capacity of architecture to express properties that can be attributed to the concept of 'antifragility'. A long-standing opinion since the time of Vitruvius is that these properties mainly concern *firmitas*, that is, the physical solidity of buildings (Vitruvius, [33–14 BC] 1997, I, 3, pp. 32–33).[1] However, the other two Vitruvian categories of *utilitas* and *venustas* also contributed to defining the essential qualities of antifragility, as they describe certain properties that allow buildings to maintain a significant role, both from the point of view of their social utility (which is independent of their momentary 'function') and their representative capacity and cultural and symbolic identification.[2] For example, the Parthenon, the most famous building in history, has been 'used' as a temple, a basilica, a church, a mosque, a gunpowder depot, a monument of itself; it has been modified, semi-destroyed, rebuilt, bombed, and then rebuilt again. Its symbolic and aesthetic values are permanent, its architectural language has expanded all over the world; it is the most antifragile building. It is no coincidence, as we shall see, that the notion of antifragility brings us back to that of 'classic'. In this chapter I discuss antifragility in architecture through the concepts of durability and flexibility, form and construction, and utility and beauty.

The need for architectural and urban design arises from the realization that the world is not as it should be. The project (from the Latin *pro-iectum*)

[1] Vitruvius's *De architectura libri decem*, written between 33 BC and 14 BC, is the most ancient book on architecture that has survived in its entirety.

[2] We will see later how the three Vitruvian criteria were conceptually outdated, first and foremost by Leon Battista Alberti in *De re aedificatoria*, written between 1443 and 1452 and published in 1485 in Florence.

implies a projection into the future and expresses the desire and hope that the change will be better than the initial conditions. In the Modern experience of the 20th-century, design meant a reduction of complexity. Zygmunt Bauman observed that to be 'realistic', and capable of implementation, the project had to simplify the complexity of the world. It had to separate the 'relevant' from the 'irrelevant' and target goals that were made 'reasonable' and 'achievable' (Bauman, 2003). As André Corboz ([1992] 1998) noted, 20th-century design practice was based on the idea of rationalization, of a sense of absolute control, according to a positivist view of means and goals. Corboz thus emphasized the need to overcome the view of an imperfect world to be 'adjusted' and instead counterpose it with a notion of the city and the territory as a 'place of discontinuity, heterogeneity, fragmentation and uninterrupted transformation'; a view that had also been expressed by Carlo Cattaneo in the mid-19th century (Cattaneo, [1844] 1971). Edgar Morin established a point of view based on complexity rather than reduction of complexity (Morin, 1990; Chiffi and Moroni, 2021, pp. 319–330). The contemporary designer is called upon precisely to govern complexity, renouncing the pre-determination of reality to develop an aptitude for the flexibility of morphological arrangements and the plurality of possibilities of use. This identifies one of the fundamental qualities that contemporary architecture must have, namely that of being antifragile. According to Nassim Taleb's definition, an antifragile system should have the peculiarity of being able to relate (also) to what is unknown. Thus, antifragility is that property that allows one to improve one's characteristics and one's ability to cope with traumas, crises and contingencies of all kinds (Taleb, 2012). Antifragility is a property that requires one to develop projects of an adaptive, transformative, regenerative and restorative nature. Conceptual help in this regard comes to us from computer science. Martin Fowler (2007) observed that the initial effort put into the quality of design is in the long run amply repaid by improved adaptability to change. According to Fowler, there are negative properties (which he calls 'technical debt') that make a system inadequate to cope with change, and a good design should remove rigidity, fragility, immobility and viscosity. Rigidity is when a single change causes numerous parts of the system to become inadequate and therefore requires many other interventions; fragility – closely related to rigidity – is when a change causes a system to become inadequate; immobility is when the elements of a system are so interdependent that the design must start from the beginning; and viscosity is when it is easier to implement a solution against the agreed initial premises. The cause that generates these four negative behaviours lies in poor dependency management. In computer science, it is said that the result becomes like a tangled skein (the so-called 'spaghetti code'). The acronym SOLID, used by Robert C. Martin (2000), denotes a set of techniques, practices and principles aimed at eliminating these negative aspects

and reducing the unmanageable complexity that arises from the succession of changes in a software. We will see later how this acronym has been taken up in architecture to designate a new specific architectural type.

8.2 DURABILITY AND FLEXIBILITY

The famous *Three Little Pigs* fairy tale, first published in England around 1843 (but already present in the oral tradition), celebrates the solidity of the stone (or brick) construction compared to the wooden and thatched house, both of which are swept away by the big bad wolf. Instead, the wolf crashes into the stone house and ends up succumbing. It is no coincidence that the fairy tale was published in England, where there are still buildings made with these three construction techniques and where therefore different ideas of building durability coexist. If we replace the wolf with the action of time, this fairy tale leads us to reflect on the theme of solidity and the life cycle of buildings in relation to their construction technique. For us Latin-Mediterraneans, still bound in a Freudian way to the permanence of stone ruins, a building must be physically solid and ideally eternal, in contrast to what is partly the case in Northern Europe or, in a different way, in oriental cultures, where the life cycle is calculated in terms of decades and not centuries.

The topic of the durability of buildings obviously cannot be reduced to physical resistance, that is, the Vitruvian *firmitas*. For the Latin author, architecture was limited to the sphere of building techniques, whereas Alberti's *res aedificatoria* extends to the wider spheres of the city and the landscape. Alberti assigns architecture the role of satisfying human needs in general terms. His concepts of *necessitas* (necessity), *commoditas* (convenience) and *voluptas* (pleasure) (Alberti, [1485] 1988, I, 9, p. 24) are taken from the Vitruvian triad (*firmitas*, *utilitas*, *venustas*), but its meanings are expanded. *Necessitas* allows the requirements imposed by construction to be traced back to the needs of human nature; *commoditas* has a wider value than *utilitas*, while the term *voluptas* is more sophisticated than *venustas*, because (as we will see later) it shifts beauty into the sphere of human sensation and intellectual activity, distancing it from a transcendent idea.

Alberti's finesse in moving from the concept of *firmitas* to that of *necessitas* expands the horizons of architecture's role with regard to time and duration. *Necessitas* does not imply that the building should be indiscriminately eternal (which is, on the other hand, one of the presuppositions of *firmitas*), but that it should have a duration commensurate with actual necessity, that is, according to an explicitly pre-determined time frame. Today, buildings are often designed with a planned life cycle. The rapidity of obsolescence of plants and energy requirements is much faster than the structural component; therefore it is often convenient to plan a precise life cycle then to replace buildings, in

order to avoid expensive transformations. Furthermore, Alberti's vision makes it possible to understand many contemporary categories, such as the ephemeral, the provisional, or interventions for humanitarian emergencies.

However, if they are not demolished, all buildings need to be transformed through time. The possibility of undergoing transformations can be seen as one of the constituent components of antifragility, because it gives the possibility of extending the life span and life expectancy of buildings, delaying their obsolescence and allowing a sustainable use of resources. Flexibility is the property that allows buildings to 'make themselves useful' for a longer period, through adaptations that guarantee the ability to satisfy new needs.

Today, flexibility is one of the fundamental requirements of any design agenda, even if it often becomes an unachievable myth. Flexibility sometimes requires higher initial economic investments and more advanced construction solutions. While it is possible to obtain various forms of flexibility from a distribution and spatial point of view, the real obstacles remain that of plant sectioning, and that of the costs required to obtain a transformation capacity, which in many cases is destined not to be utilized. Good design must therefore identify, for each specific situation, the 'right level' of flexibility that is to be utilized, in relationship to the project topic, location, living culture, construction techniques and a reasonable investment. There are different ideas on how to achieve flexibility in architecture: through the physical transformation of spaces, the possibility of different uses, the hierarchy of elements or, on the contrary, the deliberate absence of such a hierarchy.

The concept of flexibility became particularly important in the 1950s, especially in the Netherlands, at a time when 'there was hope of redeeming functionalism from its deterministic excesses by introducing the factors of time and the unknown' (Forty, 2000). Indeed, part of the Modern Movement in the 20th-century left a functionalist cultural legacy that emphasized the 'exact design' of the home. The Existenzminimum (Klein, 1928; Gropius, 1929) even attempted to predict the physical movements of people in domestic space, imagining a typification of behaviours and a reduction in the complexity of the many facets of living, also in relation to an alleged economic optimization.

However, not all 20th-century architecture had followed this line. Already in 1927, on the occasion of his project for the residential district Weissenhof in Stuttgart, Ludwig Mies van der Rohe had identified some fixed elements (the position of the pillars, the module of the façade openings, the stairs and the plant cavities) in his residential building, leaving the distribution variable so as to allow different possibilities, from the traditional middle-class housing to the 'modern' flats characterized by the continuous space separated by thin walls. Later, in 1958, Mies argued for a type of flexibility based on the neutrality of architectural space: 'I try to make my buildings as neutral frames, in which people and artworks can lead their independent life' (Norberg-Schulz, [1958]

1996, pp. 323–325). His concept of flexibility was based on structural clarity and its ability to determine the character and civic value of the building: 'clear construction is the basis of a free flexible plan' (Pizzigoni, 2010, p. 169).

The distinction theorized by Louis I. Kahn between 'served spaces' and 'servant spaces' ('the served spaces for people and the servant spaces for pipes and ducts'; Kahn, 1957, p. 2), which inspires many of his projects, determines a structural, formal and typological hierarchy between the servant elements and the served spaces, free from spatial and plant engineering restrictions. In this case, with a certain analogy to Miesian thought, Kahn worked on the concept of 'Order' as an expression of architectural space, also thanks to the contribution of the engineers August Komendant and Robert Le Ricolais.

In 1962, Aldo van Eyck and Herman Hertzberger spoke out against the idea of the neutrality of space, in a polemic against the International Style. Aldo van Eyck (1962, pp. 81–93) argued the importance of 'comprehensible structure' against 'amorphous texture', and defined flexibility as 'false neutrality', that is, as 'a glove that fits all hands and therefore becomes no hands'. According to Herman Hertzberger, an architecture that attempts to anticipate future possibilities – but is unable to choose one in particular – produces buildings with which people cannot identify. For him, the only successful approach to a changing situation can be 'a polyvalent form, that without changing itself, can be used for every purpose' (Hertzberger, 1962, pp. 115–118; 1991, pp. 146–147). In this way, Hertzberger made an important conceptual distinction: 'polyvalence' indicates the capacity of a space to be used for different purposes without changing its structure and form; 'flexibility', on the other hand, indicates the capacity of a space to be easily modified to meet new needs. Polyvalence, also referred to as 'adaptability' (Groak, 1992), means being able to vary the use of spaces, not only over long periods of time but also during the same day (work, leisure, meetings, and so on).

In the early 1960s, Nikolaas John Habraken formulated the concept of the 'Open Building' (Habraken, 1961), a multidisciplinary method of interpreting and designing the physical environment that encourages user participation and adaptive capacity over time. The main lines of the Open Building concept are: (1) the idea of different levels of intervention in the built environment, consisting of urban design, architectural design, and the concepts of 'support' (the permanent parts) and 'infill' (the replaceable parts); (2) the idea that inhabitants can influence design decisions; (3) design as a process involving different skills; (4) the idea that the relationship between structures, envelope and systems allows them to be replaced in order to perform the same function; and (5) the idea that the built environment is in continuous transformation, and that its changes must be recognized and understood.

The Open Building theory is the basis for some interesting contemporary residential projects, about which four principles of adaptability have been

identified (Boucsein and Seidel, 2015, pp. 5–14): (1) the 'neutral floor plan' that can be used in different ways by the inhabitants; (2) the addition of rooms that can be used in combination with existing flats; (3) buildings with a relatively small footprint of the load-bearing structure and a flexible technology principle to facilitate the modification of the floor plan by simply moving the interior walls; and (4) urban flexibility, that is, the application of Open Building principles ('SAR tissue method'[3]) to define settlements in which individual buildings can be replaced without altering the overall urban layout. The 'Flexible Housing' theory developed by Jeremy Till and Tatjana Schneider (2005, p. 287) is complementary to the Open Building theory and explores how buildings can be designed to adapt to the needs of their users, both before and after occupation. The Austrian architect Helmut Wimmer has developed a concept of flexibility, in some residential projects in Vienna,[4] which implies absolute structural clarity and organization of space: 'we see the building as a "stage" for the inhabitants and as a catalyst for the layering and densification of city life. Our architecture functions through its symbiosis of a primal order (the determinate structure of the building) and a secondary order (its use)' (Wimmer, 2005, pp. 136–139).

'Evolutionary flexibility' is the capacity to change the internal distribution by moving or adding walls to create new rooms.[5] 'Mechanical flexibility' is the capacity to modify the spatial configuration by means of mobile mechanisms (sliding or rotating walls, curtains, and so on), such as the stage of a theatre. This has remained at an experimental stage, with only a few realized cases, due to the difficulty of modifying space in everyday life.[6] 'Aggregative flexibility' consists in the possibility of obtaining different configurations of adaptation, thanks to a simple and modular structure that allows rooms and services to be aggregated in units of different sizes.[7]

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[3] In the Netherlands, an association called the Open Building Society was established in the 1980s, until 2000, with the aim of continuing the implementation of the 'support/infill' approach that was supported by SAR (Stichting Architecten Research).

[4] Donaufelderstrasse (1996), Grieshofgasse (1996), Wulzendorfstrasse (1996), Kanalstrasse (1998), Roesslergstrasse (1998), Wohnregal Koppstrasse (1999), Breitenfurterstrasse (2002), Akazia Terrassen (2014), Baugruppe LiSA (2015).

[5] Viviendas Alava in Vitoria-Gasteiz, Spain (Ercilla/Campo, Mangano, 2002), competition entry Zürich Steinacker (Riken Yamamoto, 2000).

[6] Maison Convertible Canale 3 in Paris (Boudon, Michel, Monnot Architectes, 1989–1991); Building Dapperbuurt in Amsterdam (Margret Duinker and Machiel van der Torre, 1989).

[7] Autofreie Mustersiedlung in Vienna (S&S Architekten, 1999); Nieuwe Australie – Boston Loft in Amsterdam (DKV Architekten, Paul De Vroom, 2006); PlusHome Arabianranta in Helsinki (ARK Oy Kahri&Co Architects, 2011).

Kazuyo Sejima and Ryue Nishizawa (SANAA), on the other hand, express the theme of flexibility as the freedom of use that everyone can have, through intangible elements such as 'suggestion' and 'information' (Zaera, 2001, pp. 6–19). In their buildings, there are no moving mechanisms, no pre-determined paths, and no places dedicated to specialized uses, so people are led to use spaces in a personal and unexpected way. The design method to achieve this kind of flexibility consists, contrary to Kahn's vision and the Open Building theory, in eliminating as much as possible any kind of hierarchy between architectural elements, between partitions and structure, between spaces of distribution and spaces of use.

The abolition of spatial hierarchies leads to the idea of the '*plan neutre*' (Atelier Kempe Thill, 2004, pp. 136–145), characterized by similar rooms that allow for different uses (16–18 m^2). An interesting precedent for this principle of flexibility, which is very common today,[8] is Casa de las Flores in Madrid, designed by Secundino Suazo in 1932.

The role of users in the design process of interior spaces generated an idea of flexibility based on the distinction between the design of the building and design of the interior distribution, similar to office architecture. As Habraken has noted:

> the purpose of design for flexibility by whatever name is to enable individual control in an otherwise collective environment. The concept of distribution of control, therefore, is at the roots of flexible architecture ... Analogy with urban design is compelling. The urban designer controls the shaping of public space and seeks to make an inspiring context for architects doing the buildings. In the same way a flexible building creates an environment for individual settlement the design of which is done on yet a lower level of control. (Habraken, 2008, p. 293)

An interesting concept that relates to both polyvalence and this disjointed design process was formulated by the Catalan architect Ignacio Paricio: the perfectibility, that is, the capacity to provide the essential elements for an initial occupation in such a way that it can be completed later (Paricio and Sust, 2000). An example opening the way for this principle is Jean Nouvel's Nemausus pair of social housing buildings in Nîmes (1985–1987). This logic

[8] Kommunales Wohnhaus in Basel (Morger & Degelo, 1993), Muracker in Lenzburg (Kuhn & Pfiffner, 1995), Grieshofgasse in Vienna (Helmut Wimmer, 1996), Wohnbauexperiment Frauen Werk Stadt in Vienna (Franziska Ullmann, Liselotte Peretti, Gisela Podreka, Elsa Prochazka, 1997), La Quadrata in Digion (Sophie Delhay, 2019) and other projects by Sophie Delhay, Pisa Cornella in Cornella de Llobregat (Peris+Toral Architectes, 2020).

was recently followed in several Berlin Baugruppen buildings,[9] the most significant of which is Ausbauhaus Neukölln (Praeger Richter Architekten, 2015). The concept of Ausbauhaus (custom-built house) allows owners/users to purchase flats either unfinished (and then complete them on their own) or with different levels of completion.[10]

The term 'SOLIDS' refers to 'buildings without a specific purpose', as built in Amsterdam by the Dutch entrepreneur Frank Bijdendijk (see Bijdendijk, 2005, pp. 42–51; Kendall, 2013). The term, as mentioned at the beginning, is taken from computer science. SOLIDS are designed and realized only in their 'support' component, that is, with all the fixed parts (load-bearing structure, façades, windows and doors, staircase/elevator blocks, plant cavities and raised floors) and delivered to the client with the interiors and internal distribution unfinished. A following phase of completion is that of infill, by the operators who acquire the spaces. This principle predicts a distinction between two different design and construction phases: the first, in which the client realizes the fixed part of the building (with their own architect); and the second, in which the occupant sets up the interior according to their own needs and possibilities (often with another designer), as occurs with office buildings (Open System method). Currently, the two buildings realized in Amsterdam include a mix of hotel, temporary and permanent residence, offices and professional offices.

8.3 FORM AND CONSTRUCTION

One of the aspects related to antifragility is structural. Leaving aside the obvious importance of physical solidity, I will try to explore an aspect related to the relationship between form and construction. In architecture, to design for a building means to place form and matter in constant relation. Design research should be based on rational structures under the banner of 'appropriateness' with respect to the project topic, location, technical possibilities and duration, to avoid the arbitrariness of architectural form and settlement phenomena. Construction in architecture is above all an architectural and artistic problem, that is, a problem of 'construction logic' (a concept related to that of tectonics; Frampton, 1999), which is to be understood as a set of logical coherences and

[9] Baugruppen are a form of inhabitants' association, widespread mainly in Germany and Austria, which allows the realization of affordable housing at below-market prices. The Baugruppen follow the principle of collaborative living and the sharing of general living choices, according to principles of eco-sustainability, like the Bau-und Genossenschaft (inhabitants' cooperatives) in Switzerland. Guidarini, S. (2018), New Urban Housing. L'abitare condiviso in Europa, Milan: Skira

[10] The same principle was adopted in Basel with the project Erlenmatt Ost Coopérative d'Ateliers – EasyJet House (Degelo Architekten, 2019).

as a system of values that architectural culture attributes to construction. As Gevork Hartoonian has remarked, architectural treatises discuss construction abundantly, especially around the concept of *téchne*, which fixes not only the technique and mode of manufacture, but also and above all their cultural position in the world of values (Hartoonian, 1994). In fact, this interpretation of the term provides that architecture achieves unity when nothing can be added or subtracted (Albertian *concinnitas*, as we will see later): that is, when the compositional norm of any classical artefact is no longer only an aesthetic category, but also a way of seeing and building.

Marc-Antoine Laugier's (1753) metaphor of the primitive cabin in his *Essai sur l'architecture* marks the birth of a structural aesthetics of architecture, according to which the purpose of architectural language is to express the 'logic of construction'. Laugier does not assign any aesthetic value to the building envelope (that is, the perimeter walls) because, identifying architecture with the structure alone, he conceives walls, doors and windows as elements that are necessary but entirely secondary. A completely opposite conception to this structural aesthetic is Gottfried Semper's theory of the 'textile origin' of architecture. In *Die vier Elementen der Baukunst*, Semper (1851) proposed the 'principle of coating' as the element able to shape the architectural space and the figurative character. Semper's primordial home, identified in a Caribbean cabin, can be exemplified as a table with a tablecloth: the supporting structure of the building would be similar to the table, while the covering corresponds to the tablecloth. While we are eating, we do not care much about how the table is made, because the tablecloth, its materiality, texture, pattern, and so on, is much more important. The table (the supporting structure) is necessary but secondary.[11]

Clarity and structural identity are the basis not only of flexibility, but also of the capacity to determine the 'civil value' of architecture. Civil value is the true starting point of the project, the very reason for its construction, and it is precisely that which is destined to have a permanent role in time, beyond its momentary 'function'. More than function, the project is in fact accomplished through a reflection on the 'theme' that leads to the identification of the character that expresses the civic value of a building. It is precisely this that makes a work of architecture antifragile.

[11] The theme of cladding as the most important element of the structure was later taken up by Adolf Loos in his projects and in his 1898 essay *Das Prinzip der Beschichtung* published in *Ins Leere gesprochen*, Paris (Loos, [1898] 1921).

8.4 UTILITY AND BEAUTY

On the contrary, the concept of 'function' is extremely fragile. It is difficult to define what constitutes correspondence to use. The very word 'functional' is elastic and imprecise. The idea of 'function' should evolve from a 'banal functionality' by the 'orthodox functionalism' to a 'shining functionality' (Semerani, 1993, pp. 47–69) linked to historical, contemplative and poetic values, which do not contradict the others, but absorb them. For Leon Battista Alberti, the category of the 'Beauty' contains within itself that of the 'Useful', and Beauty is in any case the most important quality of all:

> 'to have satisfied necessity is trite and insignificant, to have catered to convenience unrewarding when the inelegance in a work causes offense ... All care, all diligence, all financial consideration must be directed to ensuring that what is built is useful, commodious, yes – but also embellished and wholly graceful. (Alberti, [1485] 1988, 6, 2, pp. 155–157)

As Elisabetta Di Stefano has observed, Alberti censures those who have the illusion of creating a work of aesthetic merit by trusting only in their own talent and an abstract image of perfection. On the contrary, for Alberti the artist, like the scientist, must empirically deduce the rules of beauty from observation and calculation (Di Stefano, 2007, p. 45). In the Prologue of *De re aedificatoria*, Leon Battista Alberti argues that the building is like a 'body', and like a body it consists of lineaments (*lineamentis*), which come from the spirit, and matter (*materia*), which comes from nature (Alberti, [1485] 1966, Prologue, p. 14). For Alberti there are two components of beauty. The first is an 'intrinsic beauty', natural and universal, of a structural kind. Intrinsic beauty derives from the affinity of a building to its task and comes from a particular harmony of the parts (*concinnitas*). It is a kind of beauty instinctively perceived by all: in modern terms, it could be said to be 'good form'. Alberti in Book VI gives an experimental definition of this type of beauty: 'Beauty is that reasoned harmony of all the parts within a body, so that nothing may be added, taken away, or altered, but for the worse' (Alberti, [1485] 1988, 6, 2, pp. 155–157). Intrinsic beauty is therefore achieved when design operations are no longer necessary: add, take away, change.

The other idea of Beauty, intellectual and contingent (that is, a function of time and history), is an 'added beauty', given by ornaments and based on a mathematical-proportional rigour. In Book IX, Alberti thus gives a second definition of Beauty, less explicit but more technical and articulate: 'Beauty is a form of sympathy and consonance of the parts within a body, according to definite number [*numerum*], outline [*finitionem*], and position [*collocationem*],

as dictated by concinnitas, the absolute and fundamental rule in Nature' (Alberti, [1485] 1988, 9, 5, pp. 301–303).

From this dual definition, it is thus clear that Beauty is an attribute of architecture made up of permanent elements and other elements that change over time. Intrinsic beauty, deriving from a building's affinity to its task, and thus to its 'utility', also expresses a building's capacity to make itself useful over time, beyond its momentary function, and is thus one of the fundamental components of antifragility.

Referring in part to Alberti, the humanist wing of the 20th-century Italian Architectural School gave absolute significance to the idea of Beauty, proclaiming 'the utility of beauty' as an architectural invariant, in opposition to the orthodox functionalism of Northern European origin. For some Italian architects in the second half of the 20th-century (Ignazio Gardella, Studio BBPR, Luigi Caccia Dominioni, Franco Albini, Asnago e Vender, Gio Ponti, and so on) each work represents the 'inseparable synthesis of utility and beauty' (Rogers, 1958). Beauty is an absolute value that lasts over time. Gardella proposed an evolution of the concept of function in terms of 'fruition', both at the level of language as visual fruition, and at the level of Alberti's *commoditas* as rediscovery of the 'comfort of living' (Guidarini, 2002, pp. 11–17). In this regard, referring to a distinction between scientific language, common language and poetic language taken up by the philosopher Galvano Della Volpe (1960), Gardella identifies two distinct but complementary components of the project: a 'substantial' one, relating to the quantitative aspects (functional programme, volumetric data, economic parameters), and an 'essential' one, which concerns the sphere of the immeasurable and which describes the architectural work for its cultural and artistic significance (Buzzi Ceriani, 1988, pp. 79–82). It is important to remark that the substantial, quantitative and functional aspects are considered transitory, while the essential, qualitative and artistic values are considered absolute and permanent and, therefore, referable to antifragility. Antonio Monestiroli (2010, pp. 14–15), referring to the Milanese School of Architecture, observed that 'architecture is always motivated by a program that is outside itself, in the society that produces it'. Only the architectural response is exact and unequivocal, as it is based on artistic and, therefore, absolute and precise values. The precision of art: this conception of architecture as 'art' capable of producing precision leads to the notion of classicism. Classicism, stripped of all stylistic aspects, takes on the meaning of a 'desire for order' in Italian architecture. Massimo Bontempelli had expressed the meaning of a 'return to classicism' to emphasize the super-historical dimension of an ancient world taken as a model for the project: 'classicism is not a determination of time, it is a spiritual category. Classical is every work of art that manages to emerge from its own and every

time' (Bontempelli, 1974, p. 42). As Salvatore Settis (2004, pp. 101–103) then observed:

> with each new incarnation the 'classical' is presented more or less as a given for established assumption, but it reflects a project from time to time. To the 'classical' as such we continue, despite everything, to connect values considered universal, such as measure, balance, grace, intensity and naturalness of expression, messages that are always relevant to the fullness of civilization, understanding them as perpetual and timeless, and removing their nature as historically determined products.

Finally, it can be concluded that some of the attributes of antifragility in architecture can be summarized in the following points, which refer to the notion of 'classical': (1) verity, that is, maintaining self-identity, not wanting to be 'other' than oneself; (2) maintaining an ethics of design behaviour (respect for the environment, the aspirations of people, the culture of places); (3) the appropriateness of form, proportion, constructive order, the properties of materials with respect to the design subject and place and time; (4) the user-friendliness of spaces with respect to human needs and the capacity to accommodate transformations to respond to new, unforeseeable uses; (5) the possibility of using spaces in different, non-predictable ways; and (6) respecting human aspirations, the sense of cultural and symbolic identification.

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PART III

Cases and applications

9. Antifragile strategies for abandoned heritage: new approaches and a dialogue between humanism and technique

Annunziata Maria Oteri

9.1 INTRODUCTION: FRAGILITY AS OPPORTUNITY

This chapter starts from the idea that fragility[1] is an intrinsic characteristic of humans, objects and, on a larger scale, buildings, cities and territories. According to psychologists, fragility is our destiny from a psychologic and phenomenological perspective (Borgna 2014, pp. 8, 99). Like vulnerability, sensibility and hope, it is not a pathology but an ordinary expression of human life. Fragility forces one to face the passing of time and caducity; hence it is a continuous challenge towards the supposed certainties of life, an invitation to transform ourselves, abandoning our reassuring everyday life. Of course, given some specific external conditions, fragility can augment other adverse effects, such as anxiety, fears and stress, crossing the border of 'normality' and overrunning the field of pathology.

With a rather simplistic transfer, the reasoning can be extended from humans to objects in the sense expressed by Remo Bodei: not the simple matter, but something that includes strong connections with people and the environment (Bodei 2011, p. 13). Suppose one considers fragility as one of the many characteristics of objects, including architectural and urban heritage. In this case, fragility is simultaneously a value (an opportunity to give things new significance instead of thinking of them as obsolete) and a weakness (fragility can increase vulnerability, disaffection, even abandonment). The balance between

[1] The meaning of 'fragility' and 'antifragility' related to abandoned architectural heritage will not be defined in the following pages as this is not the purpose of the chapter. For definitions and related concepts clarified at a general level, see Chiffi and Curci (2020).

the two meanings mainly depends on the relationship with the context, as fragility, for both humans and objects, is amplified by indifference, intolerance, distance and forgetfulness. In this ambivalence, fragility and antifragility are the two opposite faces of the same coin.

In the case of built heritage at risk of abandonment, which is the focus of this chapter, it means that antifragile strategies should act on the exact characteristics of the object that, in other conditions, could determine fragility. It means – and this is not easy – accepting fragility and its related complexities. For example, abandonment aggravates the fragility of historical buildings, but new uses can increase their fragility too. This could happen when the new use is not compatible with the characteristics and values of the structure (physical and cultural compatibility), and/or with the requirements of the local community (socio-economic compatibility). Expelling fragility might not be a suitable strategy in architectural heritage preservation, as the result could simply be replacing old fragilities with new, different ones. Quoting the example mentioned above again, the common idea of replacing the original and deteriorated parts of a building with new sections to improve its appeal would mean contrasting physical fragility, but at the same time, impoverishing the values connected to memories, authenticity, and so on. The building is momentarily saved from physical decay. Yet, it can be 'affected' by another kind of fragility related to people's awareness of the heritage which can be perceived as beautiful in the new appearance or, on the contrary, as unauthentic. Given this second option, fragility affects the sphere of perception. Obsolescence due to abandonment would become a new form of disaffection: unfamiliarity. Hence, an increase of the economic value, thanks to the new use and related transformations, could correspond to the loss of other, no less important values that one can generically define as human values[2] (values of memory, values of identity, cognitive values, and so on).

A less popular but more responsive alternative would be to 'listen' to fragility-imagining strategies which contemplate fragility as an inevitable condition of built heritage, or even an opportunity: for instance, considering ageing and alterations – naturally excluding damage that worsens the condition of materials, structures, and so on[3] – not as an illness or infection, but as a new

[2] In a well-known essay, Alois Riegl defined the values related to cultural heritage, distinguishing between values of memory and contemporary values. In this still valid critical interpretation of values, he highlighted and explained the possibility of a conflict between the two different categories widening the focus of preservation, mainly concentrated on the material aspects of preservation, to immaterial values recognized by humankind in built heritage (Riegl [1903] 1982).

[3] It is not by chance that in the illustrated glossary on stone deterioration patterns the difference between alteration ('Modification of the material that does not necessary

language that the building expresses over time (Treccani 1999, p. 107). Under the 'material' perspective, it would mean preserving the traces of changes (for example, new volumes or decorative elements added over time, different finishings, multi-layered transformations due to different uses over time, and so on); an approach that should enhance the sometimes contradictory complexity of the construction, rather than the supposed coherence of the aesthetical appearance in the idea of renouncing to the always-claimed supposed original splendour.[4] Looking at the immaterial sphere, this approach would preserve or reinforce the complex relationships between people and their heritage. Community backgrounds and local experiences significantly influence their awareness of heritage as beautiful and relevant or, on the contrary, useless, obsolete or even imperfect, increasing or reducing its appreciation. In this view, the question is not the recognition of specific values to 'create' the identity of the place, which is the final (even if often not declared) purpose of top-down approaches, but the legitimation of complexity as the base of any possible value that built heritage may have.

Accepting fragility is not a common approach as it requires a radical change of perspective. It implies considering built cultural heritage as 'living knowledge systems' (Della Torre 2019, p. 27) rather than an immutable relic of the past, and its preservation not as a passive (and necessary) achievement but as an interesting opportunity. The prevalent idea, which has recently emerged in some Italian studies in the field, is that conservation preserves and enhances the co-evolutive potentialities of cultural heritage (Della Torre 1999, 2019). It is not a passive action (adapting to changes) but a process through which an object interacts with the environment and society, and possibly influences it. Whatever the scale of the process – the territory, the urban fabric, the building – the question is the relationship between the physical traces and the corresponding values of the object, both changeable over time, and the unavoidable economic and social transformations: two central aspects that rarely dialogue with each other.

In this perspective, 'antifragile' practices are inadequate when the idea of antifragility matches with a rigid 'defensive strategy' (Della Torre 2013, p. 71) characterized by prohibitions and permissions. This 'strategy' is based on the idea that heritage, which is fragile, must be defended from any possible exter-

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imply a worsening of its characteristics from the point of view of conservation') and degradation ('Decline in condition, quality, or functional capacity') is highlighted. See Icomos-ISCS (2008, p. 8).

[4] Even if the purpose of this chapter is not to go through the current debate on architectural preservation, it is helpful to quote some references, among the many, on the Italian two-century-long discussion regarding binomial conservation/restoration. In particular, a good synthesis can be found in Carbonara (2012) and in Treccani (2017).

nal risk (Oteri 2017). In this black and white vision (what one can and cannot do), there is the risk of simplifying the approach to cultural built heritage that, on the contrary, as a system, is characterized by relevant and undeniable complexities.

If one looks at fragility as an opportunity, it implies the acceptance of complexity as the base of any possible antifragile approach for heritage at risk of abandonment, and cultural heritage in general. It also means accepting the responsibility of interpreting and managing such complexity without delegating choices and decisions to illusionary and nostalgic returns to the past or, conversely, to revolutionary but unhistorical ideas of the future.

9.2 TRADITIONAL APPROACHES TO THE TEST OF FRAGILITY

Fragility and complexity are primary conditions when one deals with built cultural heritage, mainly in inner areas at risk of abandonment which can be considered, at the same time, fragile systems and relevant reserves of cultural capitals and capabilities. As one deals with complex systems of objects and relations, any possible attempt to simplify such complexity risks nullifying the efforts. 'Complexity is a muddle of connections that keeps things linked among them' (Minervini 2016, p. 23).

However, if one looks at the overall approach to architectural preservation in the last two centuries, it seems that the main effort on the part of experts has been to remove any kind of fragility from historical buildings. It is the core of a top-down approach, not only in terms of materials and structural fragilities but also regarding the meanings that the past transmits through heritage. It is an approach which looks at the fragilities of buildings and settlements from the past from a negative perspective (sites at risk of abandonment that need to be saved, possibly thanks to external supports) without considering the humanistic level of the question (the relationship between people and the environment). From this point of view, the richness and complexity of the 'locality'[5] have been totally disregarded in the strategies for reusing abandoned heritage in marginal areas, ignoring the fact that they have their own histories and traditions, including ideas and programmes[6] (Lupatelli 2021, p. 25).

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[5] This term is here intended as the whole of people (hence the humanistic dimension) and their history, traditions, experiences and economies which have characterized and shaped settlements, urban fabric and buildings over time.

[6] Green communities, new models for tourism and sports, preservation of historical settlements, home care assistance and other forms of resilience, which clearly emerged during the Covid-19 pandemic, characterize these areas (Lupatelli 2021, p. 26).

A discrepancy between the growing interest in new methodologies and models for studying historical settlements and buildings, and the traditional practice of restoration, is also evident. On the one hand, new interpretative models, sophisticated tools and knowledge systems are designed to 'capture our sense of responsibility' towards fragile heritage at risk of disappearing (Oteri 2019, p. 187). These models and tools not only classify and analyse the historical and physical characteristics of built heritage, but also focus on complex relationships with the productive and economic context that orients (and clarifies) the many stratifications and transformations over time.[7] Furthermore, interesting interpretative models that focus on the historical dimension of the abandonment processes have been defined. The purpose is to assess the various dynamics that triggered these processes, and their effects on the defining perception of these abandoned places in terms of safety and liveability.[8] On the other hand, architectural restoration is still mainly oriented to the patrimonialization of selected historical buildings – preferably the most attractive and symbolic – frequently for touristic purposes. Self-referential and expensive interventions, which rarely respect authentic values, are mainly addressed to restoring these selected examples from the past, transforming them into pieces of art which are excluded from our everyday life.

A process of domestication to eliminate fragility and related implications seems to be the prevalent method of such strategies. In this view, built heritage must offer the 'users' a clear educational and aesthetical message that can only be achieved by eliminating complexity. Choosing the 'right phase' with a rigid selection of values (what is or is not worth being preserved) and removing stratifications is the method used to present (offer) built heritage to the public. In the idea of proposing an understandable edition of the building or complex or urban fabric, the only result is that it puts distance between people and heritage or, which is the same, it dehumanizes heritage. To quote a significant example that regards the Italian case, a vast number of historical buildings in small villages across the country, which in recent years have been reused

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[7] It is worth quoting improvements in the use of databases and other information systems to gather different types of information on historical settlements and buildings. They combine the cartographic scale with more detailed elements of sites and building with the purpose of facilitating the management of the many different data and information related to historical building and sites (Barazzetti 2021; Fiorani 2019).

[8] In Italy, for example, the RESpro (Rete di storici per i paesaggi della produzione) association, a network of historians for production landscapes, has been improving multi-disciplinary research and initiatives to foster knowledge of rural and productive landscapes, including the socio-economic processes that conditioned abandonment and obsolescence over time. The final purpose of these studies is to provide some interpretation of the historical phenomena to suggest strategies for programming the future. Among the many interesting examples of such an approach, see Ciuffetti (2019).

as museums of local traditions with the idea of enhancing a generic sense of the place (even when traditions and identities have been definitively lost), are now closed. The attempt to understand a place through the enhancement of some specific values, along with the idea of selecting only some specific 'histories' of the site to be presented to a generic public (visitors, tourists, and so on), mainly generates a sense of non-involvement in local communities. It is the accomplishment of stereotypes, which ignores both the complexities and potentialities of cultural heritage: mills, farmsteads, hamlets, and so on have been reused and become museums of traditions and agrifood locations or scattered hotels for potential visitors, ignoring the real history of places and buildings (Oteri 2020, p. 47).

These interventions overlook the complexity and the multi-layered values of historical buildings and settlements, and they rarely positively affect the local economy or communities. More frequently, they turn out to be self-referential, useless, or even a burden in terms of maintenance costs and resource wastefulness. Furthermore, this approach does not consider the relationship, as mentioned earlier, between communities and cultural heritage, in the misguided idea that conservation is an elitist process – a prerogative of experts and policymakers – rather than a social practice. For example, at least in Italy, it is still rare to base choices and interventions on a proper evaluation of their economic, technical and cultural feasibility. Still today, programmes for managing the goods once restored are rare, and programmed conservation or prevention is not widespread yet, compared to 'traditional' restoration (Oteri 2017). Interventions mainly act on the physical and aesthetical fragilities, ignoring that such a complex network of material traces, spread knowledge and multi-scale values require complex solutions rather than simplistic remedies.[9] Given the narrowness of the objectives that often inspire them, these initiatives rarely reinforce the fragile relationship between communities and their past. On the contrary, acting for constricted purposes (for example, generating income through the reuse of a building, or at least a group of buildings), they do not transmit any sense of continuity to local communities, with that capital of culture and economies that communities should nurture. Furthermore, even when projects are based on a solid theoretical structure, it seems that the results are not sufficient to fix antifragile strategies. Discourses based on history, authenticity and/or minimum intervention cannot face the complexity that

[9] The necessity of preserving the complexity of architectural heritage first emerged in the 1970s when awareness of the memorial and social dimension of preservation arose. See particularly Council of Europe, *European Charter of Architectural Heritage* (Amsterdam, 26 September 1975), https://www.icomos.org/en/charters-and-texts/179 -articles -en -francais/ ressources/ charters -and -standar ds/170-european-charter-of-th e-architectural-heritage (last accessed 10 March 2023).

the proposed territorial dimension of heritage-based processes would imply (Deom 2015).

9.3 PLACE-BASED APPROACHES TO THE CARE OF FRAGILE HERITAGE

The recent interest in inner areas, from politicians, central governments and experts, is noteworthy as the new frontier for a sustainable relaunch of countries and towns. Moreover, the importance of cultural heritage, and culture in general, in fostering positive processes for marginal areas has been highlighted by many parties at an international level (CHCfE 2015; Cotte and Funds 2019; Voices of Culture 2020).

In this framework, top-down approaches or centralized policies are inadequate to face the complexities of working on fragile heritage and territories. As we have seen, the risk is to amplify fragility rather than reduce it. Conversely, in the last few years, place-based approaches involving communities have been under the spotlight of experts, policymakers and different stakeholders as possible alternatives to traditional, centre-based initiatives. Hence, let us suppose that complexity is the key to facing fragility. In that case, only an accurate network of ideas, knowledge and competencies – that compose the cognitive capital of communities – can provide valuable resources to manage it (Minervini 2016, pp. 38–39). Such an approach seems to characterize some heritage-based practices in marginal areas promoted by local communities.[10] The participatory processes in relaunching inner areas have been fostered at an international level (Valiante and Oteri 2022). In Italy, this tendency was incorporated into the National Strategy for Inner Areas (SNAI) in 2013. The Strategy, fostered by the National Agency for Cohesion and the European Commission, is mainly based on reducing inequalities by improving health, education and accessibility. It also empowers the enhancement of important cultural capitals that inner areas preserve. It is a place-based policy built on the idea that local communities play an essential role, as they have been considered keepers and upholders of the important legacies that marginal areas preserve.

SNAI has revealed the unexpected vitality of local communities, which are fragile but at the same time resilient, as they hold solid potentialities for innovation despite their rooted attachment to tradition and identity (Oteri 2020; Rossitti and Torrieri 2021). The proof is in the significant number of heritage-based practices promoted from north to south Italy, not only within

[10] The idea of community includes not only people, but also institutions, rules and mutual relationships (Oteri 2020, p. 48).

the SNAI programme. The topic is not the focus of this chapter,[11] but its mention is helpful to introduce what follows.

In a perfect virtuous circle, heritage-based practices activate antifragile processes as they are built (or should be built) on the specific characteristics and potentialities of a given territory. In a place-based approach, the idea of territory in itself is relevant: it is not an unreal space where theoretical models for economic growth are applied, but the totality of the territorial capitals that own strong potentialities in terms of development. In this perspective, place-based matches with antifragile, as any possible initiative for relaunching marginal territories is bottom-up, that is to say, strictly suggested by the territory itself (Oteri 2019).

Still, place-based strategies, which are (or should be) based on the collective management and care of local resources, should also be historically based, as the awareness of the potentiality of a given territory or settlement only derives from an in-depth knowledge of the historical processes which govern changes. Recording these phenomena (the productive, social and cultural tissue of a given area over time) means drawing a map of fragilities based on antifragile programmes which have been derived from the very knowledge of the fragilities themselves. It is the opposite of those attempts of territory domestication that mainly characterize top-down initiatives with the risk of increasing, rather than reducing, fragility.

Just to quote some practical examples, interesting studies on the area of the Italian Apennines, which was struck by a devastating earthquake in 2016, show how seismic events accelerate long-term, existing, even if moderate, social and economic processes (Ciuffetti 2019). It also demonstrates that in given conditions, inhabitants react in the same way (resistance or resignation, loss of the sense of community or solidarity, perception of the risk or willingness to stay, disaffection or sense of belonging, and so on). Other ongoing research on Southern Calabria[12] shows how the relevant abandonment processes were triggered back at the beginning of the 20th century due to seismic risk and hydrogeological instability. Natural hazards combined and overlapped with the agricultural crisis with effects on the economic, social, cultural and geographical aspects still currently being faced. Consequently, some of these settlements were abandoned, others transferred to the coast, and in other cases only part of the local community was transferred. In others, the

[11] Purposes and structure of SNAI can be found at https://www.agenziacoesione.gov.it/strategia-nazionale-aree-interne/?lang=en (last accessed 31 August 2022).

[12] See the Riba project 2021, 'Lost and Found. Processes of Abandonment of the Architectural and Urban Heritage in Inner Areas: Causes, Effects, and Narratives (Italy, Albania, Romania)', scientific coordinator A.M. Oteri, Department of Urban Studies (Dipartimento di Architecttura e Studi Urbani [DAStU]), Politecnico di Milano.

abandonment generated a process of exodus. Unlike the differences, the examples mentioned above show how an overall analysis of the historical dynamics of abandonment, and their territorial, social, cultural and economic effects, including the narrative generated further, is essential to address their possible future repopulation and reuse. Even abandonment, in some cases, can become a correct solution. Indeed, sometimes the end of a given productive, cultural and civic system matches with the end of that specific site, and any attempt to relaunch it risks failing.

The lesson learnt from historical interpretative studies is that antifragile strategies need to be constructed considering the transformation of territories over time as a process, rather than a sum of events (Kealy 2015). This means that all the negative and positive transformations over time (economic, social and cultural changes) are connected, shaping settlements, buildings and people as important 'reserves of meanings' (Lanzani and Curci 2018, p. 102).

This perspective, mainly ignored in the field of architectural preservation, implies that before acting on the physicality of built heritage (including the issues of risk, vulnerability, physical decay, and so on), and assessing the potentialities for its reuse, strategies and programmes must act on the complex relationships that over time gave it significance (perception, obsolescence, disaffection, and so on) and that are the results of long-term historical processes. In practical terms, strategies and choices should be suggested by those complex networks of resources, practices and competences that have moulded territories and settlements over the centuries.[13] As a consequence, both built heritage and its preservation assume new meanings. The former is not an object to valorize in itself, but a lever to activate processes for relaunching marginal areas. The latter is not only the physical preservation of heritage, but a more multi-faceted action that also implies the inclusion of heritage, with all its complex, rich and often contradictory values, in transforming and developing a given territory (Kealy 2020; Oteri 2020).

As recent studies demonstrate (Fusco Girard and Gravagnuolo 2017; Rossitti and Torrieri 2021), the place-based approach for architectural heritage preservation in fragile contexts matches quite well with the 'circular approach', where local resources, which also include people, are essential. In a circular vision, return to the territory implies the possibility of enhancing the many creative and stimulating suggestions which come from marginal areas and capitalize the various 'attempts of resistance' that have been promoted in

[13] Interesting methodological indications on this kind of approach and the usefulness for understanding the influence of historical processes on a given territory come from the field of environmental history. Regarding Italy, an unmatched lesson comes from the study by Diego Moreno (1990).

the last few years, in fragile and depopulated territories: new models of production, unique lifestyles, new relationships with nature, culture and people.

Common ground depends on the attempts to extend the lifetime of goods as much as possible, on fostering value creation based on the relationships between different actors, and on favouring a more ethical economic growth avoiding resource exploitation and land consumption (Rossitti and Torrieri 2021, p. 65). It is a conservative approach – not in the misguided idea of the traditionalist or fundamentalist – which is ideally in line with an awareness of architectural conservation.[14] Despite common belief, the theoretical base of architectural conservation is in the relationship between built heritage and present time, in the idea that changes are vital, and the past is the frame within which defining one action to ensure that what has been built over time persists despite unavoidable changes. For this reason, preserving everything that comes from the past is unthinkable. It is an anti-economic and aprioristic vision that is often wrongly ascribed to architectural conservation (Bellini 1999, p. 2).

On the contrary, and in line with the place-based approach, architectural preservation tends to preserve the past as a non-renewable resource that can provide possible benefits in the future (Bellini 1999). A deterministic approach cannot work in such a compound tangle of material and immaterial aspects given that the main purpose of antifragile approaches, not only concerning heritage-based strategies, should be to activate positive changes: in terms of new uses of the existing resources (built heritage in the specific case), but also, and simultaneously, in terms of new productions (of knowledge, competences, and so on).[15] These processes would also show awareness in a long-term perspective (and in a perfect vision of the world).

9.4 TAKING CARE OF FRAGILITIES, MANAGING COMPLEXITIES: SOME CONCLUSIVE NOTES

In architectural conservation, place-based approaches are still marginal, particularly in Italy. Despite awareness of the benefits deriving from community

[14] The term 'conservation', often used in Italy to define the act of preserving cultural heritage, is here not intended as embalming the 'status quo' but as a process through which to manage transformations. Unlike common belief, the conservation of built heritage is based on the idea that changes are vital. In this view, the past is the frame within which to define one's action to ensure that what has been built over time persists, despite the unavoidable changes.

[15] It is not by chance that, regarding fragile territories and heritage, since the 1970s the debate among experts and politics in the field of preservation has mainly been focused on the preservation of historical city centres. It is a noteworthy debate, but not comprehensive of the wider problem of inner areas' abandonment. See Fiorani (2019).

involvement in heritage-based initiatives, the lack of participatory culture in this field has been noted. Furthermore, the conventional approach based on 'expert' knowledge is the most common attitude (Rossitti and Torrieri 2022, p. 3).

If we look at the Italian case, for example, this is particularly evident. The idea that simple restoration of buildings by designing new uses is enough to activate local development prevails at the institutional level and among the experts, possibly defining new uses a priori without considering compatibility with the buildings and the context. All decisions are confined within the reassuring boundaries of projects which clearly define (or presume to define) the technical aspects, including the new functions, which are often planned without considering the specific characteristics and values of the buildings. Instead, the economic returns in terms of benefits for tourism, enhancement of local productions, increasing the sense of belonging in the young generations, contrasting depopulation, and creating new jobs, generally prevail. Again, it is a defensive strategy to contrast the common idea that architectural preservation is anti-economic. However, the effect is quite the opposite, as such projects often do not produce positive results for buildings, places and people. Conversely, as the new cultural economy tendencies demonstrate, preserving built heritage rich in values and significance can activate economic growth if based on long-term strategies, and if included in a territorial dimension (Della Torre 2013, pp. 79–80). However, this challenging perspective – which matches with place-based approaches – implies widening the limits of the project. More precisely, it requires a relevant conversion from project to process (Carrosio and Zabbatino 2022, p. 119). In practical terms, the change-over means accepting the uncertainties that such a challenging vision implies (Chiffi and Curci 2020).

From social, economic and anthropologic fields, some interesting studies have tested more suitable methods that, with some adaptation, can suggest new ways for heritage-based processes. These methods imply community participation in a 'regenerative process' (process, not project). The regenerative policy, which implies the involvement of groups as aware people rather than passive citizens, activates processes of change that are manageable but not predictable (Minervini 2016, pp. 15–16). In this case, ideas and strategies are oriented by community vitalities, passions, competencies and time, accepting that places suggest the possible strategies to be activated and how to activate them. In the socio-economic field, this method is regulated by 'incomplete agreements' as one accepts to not pre-determine what will happen, accepting the possibility that the strategy could change during the process (Carrosio and Zabbatino 2022, p. 97). It is a non-deterministic approach that implies accepting uncertainties and risks, and can be included within action research

approaches. In recent times, the possibility of applying action research[16] to heritage-based processes has been tested in the field of evaluation methodology, with the idea that adopting such a perspective is particularly urgent in marginal areas (Rossitti and Torrieri 2022, p. 5). As is known, at the same time this approach produces research (hence knowledge) and action in strict collaboration between researchers and stakeholders.

There are many difficulties in applying such approaches in heritage preservation: just to mention the most troubling, the long time required to activate the processes and gain some results and, no less, the fact that changes in mentality, which are at the base of antifragile approaches, are definitely slower than economic and social changes. Even if not always desirable, nor legitimate, the latter still condition and determine policies and programmes in any field (Oteri 2019, p. 181). Furthermore, as many bottom-up experiences demonstrate, this change could only happen considering that cultural heritage can produce more than 'simple' use (economic value) if included in broader preservation programmes which generate cultural and social values (Rossitti et al. 2022, p. 183). In doing so, reuse and conservation programmes could become a good opportunity to activate knowledge and competencies in a long-term process. 'In this perspective, built heritage is included in a coevolutionary process that looks at buildings and sites in term of potentialities (what they can offer) instead of how they could fit the new needs' (Rossitti, Oteri, Sarnataro, Torrieri 2022, p. 183).

Indeed, the results of such an approach, in terms of how to manage the physical transformations of historical buildings and sites, are still open. It is well known how communities often have a traditional or even anachronistic vision of cultural heritage. In terms of practical results, and despite the extraordinary technical knowledge that locals often have about their heritage, tendencies are mainly addressed to restoring the 'original splendour' of buildings and sites that often match with a significant or symbolic episode in the history of the site. In doing so, they often ignore the multi-layered values of cultural heritage reaching the same results as top-down approaches. However, and in contrast with what has just been affirmed, communities sometimes have a clear vision about the potentiality of their heritage, thanks to that skilful knowledge mentioned above and the familiarity that they have acquired over time with the territory where they live. If well addressed, a community-centred vision could help in better defining the destiny of sites and buildings at risk

[16] Action research is a 'participatory process oriented towards developing practical knowledge for useful purposes. It aims to integrate action and reflection, theory and practice, to provide practical solutions ... and to foster the progress of individuals and their communities' (Reason and Bradbury 2001, quoted in Rossitti and Torrieri 2022, pp. 6–7).

of abandonment. For this reason, the involvement of locals in heritage preservation strategies has been recently promoted by many parties.[17] In this sense, whether the roles of communities impact or do not impact on the physical dimension of buildings and sites, the benefits of their involvement in fostering heritage-based good practices are undeniable.

As some experiences demonstrate, another risk which can particularly affect the action research method in architectural preservation is that the process stops at the phase of knowledge and co-learning,[18] without facing the phases related to co-design and action. This is partially due to a 'natural' tendency in the field. As mentioned above, working with complex, multi-layered values implies a scrupulous and long process of knowledge and awareness of historical processes and transformation. The risk is gathering too much data from different sources and of various natures without having the proper tools or competencies for plotting and interpreting them. However, this is not the only risk, as decisions and actions, due to the complexity of the matter, often imply closure to non-expert knowledge. It is a fact that many projects and programmes for preserving architectural heritage in inner areas are missed occasions to transform knowledge into actions. To quote a practical example related to reuse of vernacular heritage as part of local development processes, a project promoted by Fondazione Cariplo, Distretto Culturale Valtellina, could be considered a good example of an action research approach in cultural heritage for the centrality and empowerment of the community that can be enriched through experience. In this case, the idea of recovering the dry stone wall terracing systems of the valley, which represents a fundamental element for the economic, cultural and landscape features of the place (the knowledge), is combined with the idea of training the communities to maintain and care for this interesting example of built heritage (the action). It is no secondary aspect that the dry stone terracing system guarantees hydrogeological stability and wine production (Osti and Jachia 2020). Other interesting heritage-based examples seem to adopt such an approach (Fondazione Fritzcarraldo 2019).

These practices mainly come from the bottom: spontaneous organization, occasionally supported by local administrations rather than institutions and policymakers. The reason is not only due to the difficulty of changing mental-

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[17] As is known, a significant step into this direction has been taken with the so-called Faro Convention which defines the idea of heritage communities. See Council of Europe Framework Convention on the Value of Cultural Heritage for Society (2005), https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=199 (last accessed 10 March 2023).

[18] Action research is commonly articulated into five steps: co-definition of the problem, co-learning of relevant knowledge, co-learning and co-design actions, taking actions, and interpreting results (Rossitti and Torrieri 2022, p. 7).

ity. Certainly, young people, informal groups, and brave businesspeople and stakeholders are more inclined to accept the risks of a process (not a project) and the uncertainties of the results than are institutional groups and politicians. However, despite significant investments in the reuse of built heritage to foster cultural and social innovation in marginal areas at an international level (Rossitti et al. 2022), rules and tools are still oriented to traditional approaches and they cannot fit the complexity of action research processes. For example, initiatives that aim to preserve the complexity of built heritage and, at the same time, have the ambition of fostering local development (in short, the antifragile initiative) always imply different possibilities. All of them are characterized by different uncertainties, and it is still difficult, given traditional tools, to manage such uncertainties. Some interesting attempts to apply multi-criteria methods in the reuse of built heritage seem to give 'positive results as they allow to analyse decision-making problems in complex negotiation and mediation processes between different interests and values' (Rossitti, Oteri, Sarnataro, Torrieri 2022, p. 183). Through multi-criteria methods it is possible to list the objectives and priorities of all the involved stakeholders, which frequently clash (for example, the necessity of preserving the complex meanings and values of the building, and on the other hand, the needs of communities that may not converge with this), and to manage the conflicts by evaluating different solutions and decisions.

Unlike the validity and interesting perspectives that open up, the examples mentioned above are still far from becoming commonly applied tools and methods. Nevertheless, a quick mention is helpful to (momentarily) conclude these reflections. Whatever the instruments one uses, whose inadequacy hinder any possible progress in heritage-based processes for marginal areas, a significant change of approach seems to be more urgent starting from the idea, always claimed but rarely applied, that built heritage is an extraordinary palimpsest of different values, and its preservation, more than an economic investment, is a cultural and social capital for humanity. In other words, more than antifragile, the approach to caring for built heritage must be responsible.

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10. Territorial variety as an antifragile resource: the Italian case

Antonio De Rossi and Arturo Lanzani

10.1 A HISTORIC TERRITORIAL ARTICULATION

The extreme variety of the Italian territory, of its 100 cities and 1000 settlements and agricultural contexts, has long been known to the curious traveller, as well as to those who have studied this country from a political, social, economic, landscape, cultural, artistic, natural and ecological point of view. This variety stems from the multiple forms of relationship that have been established throughout history between economy, society and environment, and is expressed in different settlement-infrastructural and agro-ecological arrangements.

Not all the pieces in this mosaic – the subject of attention since Carlo Cattaneo's studies in the mid-19th century, and to which a large part of *Storia d'Italia Einaudi* (Romano and Vivanti 1972–76) and works by scholars such as Emilio Sereni (1997) and Piero Bevilacqua (1996) are dedicated – are equally well known, however.

The contexts that have emerged over the long term of high hills and mountains with mixed agri-sylvo-pastoral and also commercial craft economies are less well known. Knowledge of them has often been obscured by mountain landscape imagery linked to a univocal cultural image that anchors its forms to the late 19th century (at a time of maximum anthropic strain and incipient crisis), or to a certain, wholly inappropriate idea of a wild natural space, which erases the complex construction of its ecologies, removing its inhabitants and their material and productive cultures, originating in a 20th-century urban outlook aimed entirely at transforming other spaces into recreational landscapes (De Rossi 2014, 2016).

Equally little known are those extended urbanisations located along valley floors, on rural plains and coastlines, built during the radical economic, social, settlement and infrastructural metamorphoses of the 1900s, particularly in the second half of the century. These contexts cannot be reduced to the image of the widespread city and sprawl because they are only partly the result of the

dynamics of urban decentralisation, and are based on original endogenous models of urbanisation of the rural territory or on the reorganisation of settlements that were once located elsewhere (on a hill, inland, and so on). These contexts, which experienced the development of specific manufacturing, trade, service economies – and sometimes, along part of the country's coastline, also forms of mass tourism – were essentially read in terms of their original socio-economic patterns, their morphologies and settlement situations during the years of growth between the early 1990s and early 2000s (Clementi et al. 1996; Lanzani 2003). Only a few scholars have interpreted them in their indissoluble intertwining of settlement and socio-economic aspects over the subsequent 20 years of selective development – with contexts in crisis and contraction, and contexts in dynamic and radical transformation – and even more rarely have they been thought of as a structured and specific 'field' of integrated and contextual political practices and projects, as a 'world' within which to elaborate their own distinctive images of the future (among the few attempts: Viganò 2001; Lanzani et al. 2013; Lanzani et al. 2016; Viganò et al. 2016).

This mosaic of territorial contexts and situations is held together – and this is a central node – by a complex and changing system of trans-scalar relations. Undoubtedly better known in their all too schematic juxtaposition are the varying historic relationships between the 100 medium-sized cities of central-northern Italy and their respective rural districts, and those between some of the big cities of the south and the surrounding boundless countryside. Equally well known are those that developed in some regions in the second half of the 20th century, which are fully traceable to the model of the metropolitan area embedded within the geographies of international networks and global cities.

Much less well-known and studied, on the other hand, are the long-standing relational patterns between the mountains, the nearby foothills and valley floors, and the distant plains with their respective towns and cities, redefined in original ways during the industrial revolution; or those equally changeable but persistent relationships between urban areas and the inhabited and manufacturing countryside throughout much of the country, especially in the north; or again, the relationships between inland areas and the coastal system of peninsular Italy; and last but not least, those still to be investigated between networks of businesses in the territory, widespread urbanisations and the reinforcement of medium-sized and metropolitan cities. In short, this variegated territorial settlement mosaic has never been characterised by localist closure, but has always been organised and defined starting from a context of wide-ranging trans-scalar relations. This relational system can only partly be traced back to interpretative categories more widely used in the international sphere, but often within very general interpretations.

So, a multiple device of territorial significance, which vertically constructs specific settlement structures in the interplay between environment, economies and society, and is horizontally based on metro–rural and metro–montane interdependencies (Barbera and De Rossi 2021). A relational dimension that seems to have been increasingly denied over the last 30 years, in favour of the return of traditional forms of dichotomous and oppositional representation (city versus countryside and mountains, metropolitan versus inland areas) that definitely do not correspond to the country's historical reality.

This condition of great variety and plural forms of integration-interdependence – which offers a more radical and extreme expression of a specific character of the European territory – seems to have always been one of the main elements that has enabled Italy to respond to quite unexpected events, be they epidemics, natural disasters, upheavals in the systems of international relations, changes in production paradigms and in the different forms undertaken by the capitalist model.

Historically given up for dead or permanently in crisis, Italy seems to have repeatedly reacted by 'putting different parts of the territory to work'. Even if focusing exclusively on the interval between the end of modern history and the present day, there are numerous and continuous cases: the previously uninhabited valley floors and rural territories which, between the late 18th and late 19th centuries, became the site of new infrastructures and proto-industry, agriculture and widespread industrialisation which absorbed the crisis of the highlands; then the medium-sized and large settlements which, in the middle phase, became typical industrial metropolises or towns for 60 years, but also local urbanisations which redefined the strength and specificity of manufacturing Italy during the post-Fordist industrial development crisis; the coasts that take on urban port, urban service or even tourist configurations, changing as necessary; through to today's networks of medium-sized internationalised enterprises established in widespread urbanisation which, on one hand, are directly connected to transnational networks, and on the other hand, are capable of assigning a specific role to quite a few large cities and their metropolises.

In this incessant recommissioning of parts of the territory there is also more specifically a form of reuse, recycling and continuous rethinking of its settlement structure, its complex and articulate territorial infrastructure. In the multiple organisational models and the action of their frequent reuse lies, in our opinion, historically the antifragility of this nation, which can be seen as a real case study in this sense. It is a country that has certainly lacked 'robustness' to date, prone to 'metamorphosis' rather than 'resilience', lacking the ability to manage predictable risks, but unexpectedly reactive to radical uncertainties (Chiffi and Curci 2020); a country that has succeeded in emerging from crisis many times and has often reinvented itself, thanks to its ability to draw on this variety.

10.2 A VARIETY UNDER ATTACK IN THE LATEST DEVELOPMENT DYNAMICS AND POLICIES

This antifragility is not only under-recognised by all the one-sided narratives about the country's socio-economic and urban development, but also today, in our opinion, it is heavily under attack from both 'internal' and 'external' dynamics. The risks related to the internal dynamics seem to us to be quite evident: the scarce maturation in Italy of a political, technical and administrative culture capable of acting consciously with respect to these characteristics of variety and interdependence, favouring their valorisation, reform and intentional modification. All too often this variety has been tapped into with the parasitic and extractive approach of the 'miner', which has led to the consumption and dissolution of enormous deposits of socio-territorial fixed capital, regional cultures, and minor construction and infrastructure, favouring the juxtaposition of improper new construction and infrastructure incapable of establishing a relationship, even in contrast, with the existing palimpsest; all this within an imagery that is linked more and more superficially to a consumerist idea and practice of growth without development. In this absence of care, in this inability to manage change (in the territories put to work) and to initiate radical reform (in the territories thrown momentarily into crisis), this element of constituent antifragility risks being consumed (Secchi 2014).

The external dynamics are those related to the forms and policies of development that were imposed in the second half of the 20th century. These are the dynamics of a globalised economy, but also policy orientations that led to the concentration of resources, strategies and development imagery in few contexts: the big metropolises that were assigned the exclusive task of incubating innovation and research; some major artistic and scenic sites (art cities and postcard landscapes) to be included in the global tourism circuit; highly infrastructural production 'platforms' to host clusters of internationalised companies and major logistics facilities; but also the concentration of social and health services of excellence – as seen during the pandemic – in just a few central locations. In short, an idea of development that proposes unilateral and uniform spatial and organisational models, which focuses on the triad of concentration (of excellence), specialisation (of functions) and separation (from the territory), reproposing *ad libitum* an image of the territory as a *tabula rasa*, devoid of roughness, thickness, variety (of which the 'compensatory' investments in the remaining territories are a negative part). These are imageries, visions and concepts that we find abundantly present both in national and regional planning documents, in the last programming seasons of the European structural funds, and in the most recent National Recovery and Resilience Plan (NRRP).

That limited ability of the ruling classes and technicians to recognise the territorial variety and interdependencies that have created adaptability, combined with extractive exploitation, characterises more than a little of the politics of contemporary projects on the historical materiality of the country, from the land-use interventions which emerged at different times, to infrastructural development on a territorial scale and its punctual construction within it. It is on these that we are now going to focus.

10.3 REDISCOVERING A HISTORY (REMOTE AND RECENT) OF PLURAL TERRITORIAL INFRASTRUCTURE

From our point of view, based on the initial considerations on the plural nature of the country, it becomes decisive to pick up the threads of another 'history', of long duration, centred on the infrastructure of the country. Interest in this history resurfaces today in the face of the crisis faced by cities and territories, climate and environmental change, the need for adaptable, resilient, plural but integrated socio-physical models, in the face of the demand for antifragile planning and design. It is the history that unravelled between the 6th and 13th centuries, from the ruins of the ancient world to the great settlement cycle of the first centuries after 1000, expressed, as we know, in the local stones of its towns and villages, in skilful adaptations of buildings and agricultural soils to the complex gemorphology and local environmental conditions. It is the history of widespread and varied urban–rural infrastructures, which are its fundamental support. In this sense, a series of contributions by Middle Ages historians and, above all, modern historians who devoted important pages to territorial infrastructures between the beginning of the 16th century and the middle of the 19th century, can be reread, analysed and observed with new planning intentions.

It is less usual to recognise an at least partial persistence of this other history within modernity and in the first 100 years of the Unification of Italy. It is, nevertheless, a significant theme for us, which we can only evoke with a few examples.

At a time when the country was basing its mobility on a number of major railways on the plains and along the coastline, overturning historical balances, a no less interesting history of minor railways and tramways – many of which were decommissioned in the second half of the 20th century – was beginning to unfold, adapting to a tormented orography, which nevertheless succeeded in connecting and networking a complex geography of locations and rural and industrial economies, reactivating important deposits of fixed social capital. This was achieved with technical solutions, capital, original and sometimes specific management models (Maggi 2003). Similarly, the laborious con-

struction of a basic infrastructure in the educational and health fields, while certainly following homologous national service and building models, nevertheless shows a considerable capacity to adapt to the Italian territory, with the construction of original spaces and models, as in the case of small schools or service centres articulated across the territory. In some specific territories, such as the valleys of the north-west inhabited by the only long-standing Protestant community in Italy, the Waldensians, this led from the early 19th century onwards to the construction of a dense network of hospitals and schools in the mountains, guaranteeing levels of care and education comparable to those in urban areas.

The very long history of land reclamation in Italy not only still retains in modernity the ability to adapt to very diverse natural conditions with original technical solutions, but also launches cognitive operations (Comitato per la Geografia del Consiglio Nazionale delle Ricerche – Istituto Nazionale di Economia Agraria 1932–38; Istituto Nazionale di Economia Agraria 1931–39; Giusti 1943) on demographic, social, economic and cultural issues of considerable scope, which will be at the origin of a particular territorial knowledge of the country, anticipating the developments of some social sciences in an original way. On the design front, it is true that a political–cultural matrix in favour of small property and dispersed settlement predominates, revealing its limits in the face of new market dynamics. However, it is also worth mentioning the capacity on the part of those reclaiming land to build original cooperative management and service models in the reclaimed areas and to establish technical bodies – for example, rural engineers and mobile agricultural professorships – capable of reforming the multiple balances between society, the economy and the environment, paying special attention to contextual specificities.

In this sense, reference must be made to the highly original experience of integral mountain reclamation, with the creation of reservoirs that respond in different forms to the needs of hydroelectric production and the accumulation of water for irrigation in the north and south of the country, and that combine – thanks to the work of the Forestry Corps and Civil Engineers – interventions on the hydraulic network with important operations of management or planting of forests, and the construction of road networks to modernise historical settlements.

Lastly, after the Second World War and until the early 1970s, the commissioning of many densely inhabited countryside areas, their urbanisation and widespread industrialisation, seems to be intertwined with an original territorial infrastructure. It implies a certain capacity of national sector policies, whether those of Ina-Casa or school building programmes, to engage and interact with the articulated geography of the country. At the same time, an original incrementalist municipal policy of infrastructural adjustment in territories subject to widespread urbanisation and industrialisation was initiated.

In its initial phase, this seemed to express some form of minimalist rationality. Not only that, in more original forms, it is also worth mentioning the cooperative promotion of some more innovative infrastructural interventions of a supra-municipal nature (network management, the promotion of business services), and some not sector-specific, but decidedly multisectoral and multifunctional infrastructural action and planning strategies (Di Biagi 2010; Secchi 1996; Lanzani et al. 2015).

In the promotion of these projects, the action of municipal public enterprises and cooperative enterprises plays a decisive role. These enterprises have long been capable of promoting innovation and are linked to important political cultures in the country (be they Catholic–socialist or social–communist). Of course, all of this accompanied by a notable lack of ecological and environmental awareness that cannot fail to strike us today, but also with sensitivity to issues of socio-spatial justice that are now much reduced in government practices.

10.4 FROM THE IDEA OF SPATIAL INFRASTRUCTURES TO A PANORAMA OF UNIFORM AND/OR SOLITARY INFRASTRUCTURES IN SPACE

Everything changed, we believe, over a period of time ranging from the 1960s – when the first glimpses were recorded – to the 1990s. At the same time as the full awareness of this variety of contexts is asserted in some territorial knowledge and a policy attentive to differences is being drafted, it seems to us that an increasingly one-sided idea of development is actually asserting itself, and with much more force. The complex conception of territorial infrastructuring that still coexisted with sector-specific action to some extent is being definitively replaced by a crowd of small and increasingly uniform infrastructural works (and also management models) on one hand, and by the push towards large works and the concentration of interventions in a few limited centres on the other. The result is not only an increasing mono-functionality, sectoriality and acontextuality of the infrastructures built, but also the abandonment of historical infrastructures that responded in a different and contextual way to general demands for soil care in the face of hydrological instability and seismic risks, for accessibility and mobility, and for fundamental infrastructures in the field of educational, health and socio-cultural services.

The reorganisation of the railway network and the hospital network are good examples of this turnaround. Not only because of the enormous drive towards concentration and polarisation (not always justified, given the polycentric matrix of the country), but especially because the construction of the high-speed rail network has not been accompanied by concomitant plans to

reorganise local public transport and regional railways. Similarly, the building of large hospitals of excellence has not been followed by the construction of local territorial health centres capable of extending the services offered by the central centres to the various territorial realities. Between large, specialised works and the territorial dimension there is a kind of fracture and separation that no policy has so far succeeded in redefining in terms of reconstructing trans-scalarity and spatial continuity. At the same time, the large-scale works associated with this idea of modernising the territory fell like spaceships onto a territory made a *tabula rasa*, without establishing any dialogue with the context in its most varied forms.

At the other extreme, we could talk about the ways in which the road network of widespread urbanisation has been reformed, with a mishmash of ring roads, by-passes, roundabouts, pavements, cycle paths and car parks, built in forms not infrequently improper with respect to the specific mobility needs and arrangements of the various territories, physically alien to the physical contexts and their landscape characteristics. Entirely self-referential, mechanically reproduced and replicated imagery and technical protocols won.

Even the recent themes of ecological transition and adaptation to climate change are often posed with equal indifference to different contexts, both in the literature that refers to international smart city models, and within a debate that is more specifically Italian in some respects, focused around a hypothetical 'return to the villages'. In both cases, urban ecological conversion and the search to escape from the cities remove both the extensive urbanised regions within which those large cities are embedded, and the integrated territories within which those suburbs can continue to be inhabited from the visual horizon and from any intervention strategy. They concentrate on virtuous methods of sustainable mobility of proximity and vertical forests (suitable, at best, for very dense and compact cities), not questioning how to promote mobility to the territorial dimension, forestation in peri-urban and widespread urbanisation contexts, or the specificity with which energy-saving issues can and should be dealt with in those mountain territories that are beginning to be reinhabited. Or they imagine outlying islands for the more privileged classes, without realising that their questionable promotion still requires a renewal of the infrastructure of the surrounding areas. All this shows – as dramatically highlighted by the pandemic – how long ago the territorial dimension was expelled from Italy's policies, to be reduced to a mere diagrammatic and abstract space; a non-physicality of things that also runs through the philosophies of the smart or best practices that can be replicated, based on the notion that it is enough to stick to a procedure to solve the complexities of contemporaneity (De Rossi and Mascino 2021). One wonders how this has been possible. It is not easy to answer, although we believe that there are at least three elements at the root of this evolution.

The first, as we have already mentioned, is a combination of an idea of the future, of the economy and society, of environments typical of the 'good life', increasingly widespread and powerfully shared by the segment of the population with high cultural and relational (and only sometimes economic) capital, and capable of colonising the imagination of more and more people (Florida 2005; Glaeser 2011). It is based on a literary and artistic culture of images and a 'post-modern' communicative knowledge focused on scenarios that are both metropolitan and tourism-oriented, and also characterised by 'objective' drives towards greater uniformity of socio-cultural imagery and handling of differences (which are only 'valorised' within that unitary model).

The second element seems to be related in a complementary form to the previous one and resides in the role played by two factors: on one hand, in development policies, the neo-classical urban–regional economy and, above all, the practices of territorial marketing and strategic business planning applied to territories and cities (Begg 2002; Caroli 2006); on the other hand, within the physical transformations of space, technical-engineering cultures, increasingly sector-specific and self-referential in the definition of the criteria of their technical-economic optimisation, and based on a parametric and procedural vision that ends up invalidating the environmental assessment proceedings, responding essentially to the canons of the technical-solutionist paradigm. After all, even sophisticated place-based design approaches to development policies and those connected to a territorialist vision of works fail to break away from restricted niches and from experiences that, while interesting, are incapable of influencing widespread practices (Barca 2019; Magnaghi 2003), not least because the innovative policies within which they have had the opportunity to experiment – such as the National Strategy for Inland Areas – have had severe limitations precisely in the implementation and realisation phases.

Lastly – and this is the third element – it seems that this evolution is linked to the methods of production of infrastructural projects, and in part also of urban planning; to the increasing presence of promoters who are totally extraneous to the territories of intervention; to the methods of financing the works and to the procedures for verifying their appropriateness and feasibility. To be clear, the municipalised companies and cooperatives mentioned above, but also the private construction companies rooted in the contexts, used to have a certain ability to consider the specificity of the territories, as well as a tendency to accept a certain multifunctionality of the operations suggested by the territorial authorities. All this seems to be coming to an end, in a context of changed relationships of power between investors and local players.

Obviously, if these are the reasons, the question remains as to why this universe of small, uniform and non-contextual works, or of major operations that draw a *tabula rasa*, is more radical and has a more devastating impact in Italy than in other European nations. Of course the impact seems to be more devas-

tating because it takes place in a territory, a nexus between society, economy and environment, that is more diverse and differentiated, as we have explained, than any other European country.

However, there is more: the radical nature of this dynamic has other reasons too. It stems, in our opinion, from the extreme weakness of territorial governance in our country, a weakness that, in turn, stems from certain specifically Italian dynamics.

This is primarily due to a state system where regional institutions have become so many centralised and bureaucratised half-states operating in a hypersectoral manner (instead of being the place where plural development models and paths and integration between sector-specific policies are built), and where the municipal structures – which have remained unchanged and never been reformed, something which is almost unique in Europe – are unable to cope with the forms and demands of everyday territoriality and are structurally incapable of drawing up integrated infrastructural policies and projects. But above all, the crisis point is determined by the disappearance – due to a series of unfinished institutional reforms – of those intermediate bodies (provinces, in some regions the mountain communities, those districts that were the result of a season of experimentation in the 1970s and 1980s, and so on) that represented the point of synthesis between the growing centralism of the state and regions on one hand, and the nebulous multitude of small Italian municipalities on the other. In this intermediate dimension and scale, which remains unresolved, there is the possibility of recomposing policies and projects for the territory.

The second reason lies in the systematic contraction of local technical-administrative structures, which, as a result of repeated recruitment restrictions and spending cuts, are in a permanent state of crisis. The problem is not only one of quantity and expenditure, but also one of personnel selection and role definition. These structures have been increasingly deprived of people with territorial and organisational skills capable of collaborating on integrated projects, and have witnessed the penalisation of officials capable of building projects and taking responsibility. Above all, these structures have undergone the exponential growth of a bureaucratic procedural-legal verification of documents, of passive compliance with national and international procedures, which has led to the expulsion of any generative action (also due to a questionable approach to fighting corruption that fallaciously aims to remove all discretionary power, instead of enhancing and publicising the assumption of responsibility by staff).

The third reason lies in a formal continuation of traditional planning methods that have never been updated, but are constantly circumvented by emergency intervention procedures and 'by way of exception' – be they sector-specific works defined by central government and the regions, or local

initiatives selected through calls for public or private intervention – which are not required to be defined within an overall scenario built through forms of public debate and explicit participation by the general public, and not even to be included in an integrated strategy, at least in the medium term. Exceptional procedures and projects or ad hoc variants, which are never induced to account for and make the most of what already exists in the area and what will be called upon to remain, to link new inserts with renewed maintenance of elements already present, to think of grafts as multifunctional projects as much as possible, to activate effective forms of collaboration between local knowledge and subjects and external knowledge and technical subjects in the preparation of projects. The figure of a juxtaposition or overlapping of the new indifferent to what already exists prevails.

In short, in other European nations, those equally present general forces that we described earlier seem to find a counterbalance in a practice of planning and design of the territory that has not disappeared entirely and, if anything, has been updated, in an elaboration of projects which, although laborious, is more interdisciplinary and cohesive. In Italy, however, these general forces seem to be asserting themselves more radically.

10.5 FEW MARKETING SCENARIOS, A LOT OF JUNKSPACE AROUND NEW WORKS, AND A LOT OF WASTE DISPERSED THROUGHOUT THE TERRITORY

What are the effects of this change in the materiality of the country? If we had to use a synthetic image, we could say that, instead of enhancing the antifragile potential of its territorial variety, which is not disappearing, contemporary Italy is marked by different impulses that trivialise, threaten and not infrequently destroy it.

In a few, limited contexts, this variety is not denied, but loses its meaning within an active construction of territorial model scenarios centred on territorial marketing. On one hand, there is that of the global city assumed with particular economic and social radicalism, as well as architectural-infrastructural radicalism, in cities such as Milan and in the many towns and cities inspired by the same model. On the other hand, there are those more or less intertwined with global tourism, such as art cities or ‘quality landscapes’, whose constituent processes (and with them the matter of their potential care and reform), which tend towards a strong hypostatisation of their image, have often been removed. This is a device that obviously finds its first expression in Venice, and then spreads and strengthens with the recognition of World Heritage Sites, emphasising the distance between form and generative processes, an absolute idea of landscape scenery, as opposed to that of a territory to be inhabited.

Apart from these specific cases, two different dynamics clash with different weights in most of the territory. First of all, the production of a series of infrastructural interventions and works, but also buildings, which in their totally self-referential and non-contextual forms make evident and tangible – here more than elsewhere – the image of an invasive generic city full of junkspace, which asserts itself in the name of a 'fuck context', never made explicit, but actually widely practised, and perhaps even become a sort of common feeling, of which an ironic photographic documentation is contained in the 'Padania Classics' project (D'Abbraccio et al. 2015).

The second is the tendency to overproduce an infinite amount of waste, residue, leftovers, rubble; whether it be land painstakingly qualified in the face of degenerative dynamics, minute infrastructures or public and private buildings. We usually find them in peripheral and not only urban areas in Italy – perhaps much more than in France, Germany, Spain or the United Kingdom – and particularly in perhaps more original forms in two contexts that are typical and in some ways specific to this nation. First, in the 'high lands', in the form of countless 'leftovers' generated by an age-old and radical phenomenon of demographic contraction that has emptied once densely populated territories; a contraction that has been escaped by a few portions invested by the tourist dynamics mentioned above. And then in the contexts marked by the widespread urbanisation of the last third of the 20th century, in heavily industrialised high plain and valley floor contexts and, at the same time, in different forms along the Italian coastline: more rarely in the form of 'surplus' due to some very recent dynamics of contraction, almost always in the form of 'waste' of an urbanisation lacking in value gradients, where, unlike the consolidated city, where replacement prevails, relocation dynamics prevail, generating continuous abundance of existing and new buildings (and therefore major land consumption).

To make the picture more complicated, one cannot fail to point out the intrusive crossovers between junkspace and (early) abandonment space in a large collection of unfinished works particularly widespread in southern Italy (once again the subject of an ironic photographic documentation of the 'Sicilian unfinished').

It is not easy to assess the long-term consequences of all this. As authors of this chapter, we oscillate, to a certain extent, between two considerations. The first is that, in many ways, this approach seems to be destructive of that lively territorial variety which, much more than other 'moves' suggested by the literature on antifragility and preparedness, seems to us to be the main resource for the future. In this sense, we believe we should speak of the progressive fragilisation of many Italian living and working contexts, of numerous local collapses in the face of disruptive global dynamics (economic and environ-

mental), which generate new socio-territorial inequalities and a more general loss of complexity and plasticity of the national territory.

In other respects, a doubt (or a hope?) remains: that, once again, this 'excess', this fractal and decomposed diversity, may constitute the 'grip' for dynamics of reinvention of forms of reinhabitation and socio-territorial redefinition (De Rossi 2018). It remains doubtful whether, in the long term of the country that we mentioned, history can still resurface today in the face of the crisis experienced by cities, of environmental change, and the need for adaptable, resilient and plural but integrated socio-physical models. In fact, we believe that today we can read a possible growing conflict between a historical bloc made up of particular and parasitic revenues, bureaucratic-technocratic modes, and economies built on that non-territorial and sector-specific thinking mentioned above, valorisers and capitalisers who transform residual symbolic and usage values into exchange values; and on the other hand, drives – which we recognise in quite a few micro-histories and experiences in the field – towards the production of new economies and cultures, bottom-up and diffuse, within the framework of the stagnation of cities and climate change, which can perhaps find their starting points and leverage precisely in those rejects and leftovers. One thing is certain: that historical bloc, understood in Gramscian terms, is today no longer able to produce visions and projects for the future of Italy.

10.6 BETWEEN IMMERSION IN PROCESSES AND CRITICAL THINKING, BETWEEN VISIONS OF THE FUTURE AND SPECIFIC ACTIONS, STARTING FROM WHAT IS THERE

How, then, can we fit into these dynamics? What is our possible work as scholars of the territory and, at the same time, as lovers and practitioners of design knowledge? How do we work to make the Italian territory less fragile, enabling it to prepare for unforeseeable events and radical risks?

Obviously, we have no answer to such questions. We can only propose a dual oscillatory movement, which perhaps seems inevitable and in which we are in fact involved, and an indispensable starting point.

The first oscillatory movement is that in which we participate in the elaboration of local projects by groups of citizens and communities of intent, more often than not by weak territorial institutions in geographical contexts on the margins of major national policies and projects. It is a task that consciously accepts the structural limits of this action and also its stringent constraints, which often prevent working on a correct territorial scale, to elaborate strategies for a deeper recomposition and reform of infrastructural and territorial frameworks (envying many colleagues abroad who find themselves involved

in more complex processes). At the same time, however, in the face of the stagnation and paralysis of many cities, we are aware that marginal spaces now represent a place of potential innovation, a real possibility for reorganising society, the environment, economies and the materiality of things in a different way, as demonstrated by the 101 cases of regeneration practised from the bottom up that are currently taking place in Italy's inland areas and urban fringes. This work is accompanied by a critical exercise with respect to the development ideas and policies widely implemented in the country (and the resulting generative processes and interventions); a critical exercise that does not, however, lead us to the inaction of the 'observer's' perspective.

This pendulum that interweaves action within things and critical observation, and which seems to have characterised much of the most interesting culture of the Italian territory in the 20th century, now seems to be much less practised in professional and academic spheres, where the logics of the designer who conforms to the demands of the promoters (whether public or private), or of the critical observer who detaches himself from the practices of the project, are espoused more unilaterally. Of course it has to be assessed each time to see whether it is useful or not to operate under severely limiting conditions and with partial margins of action, and this assessment can be incorrect each time. At the same time, it forces critical thinking to come up with counterproposals for radical reform of the processes at work, taking risks that the critical observer usually refuses to take (Coppola et al. 2021; Barbera et al. 2022).

The second oscillatory movement is between the attempt to redesign broad and plural territories as a whole, to reimagine the articulation of their everyday capital, their infrastructural, environmental and economic assets, and at the same time the co-definition of partial, punctual, feasible, implementable actions. This oscillatory trend also seems to go against the flow. A practice predominates in orthodoxy today that involves the construction of scenarios and non-spatial strategic frameworks drawn up by various policy experts, followed by the involvement of specific technical operators working on the materiality of the world. It is a trend which, in schools of architecture for example, has expressed itself in the hegemony of the figure of the planner and the technological architect and/or artist, and in the emptying of the intermediate space between architecture and town planner. This trend can also be found in different forms and intensities in other study paths, be they those of the engineer, economist, agri-forestry expert or geologist, where the research on the ground, the focus on territorial and spatial aspects, is equally downplayed if not removed. The movement proposed here is lateral and partially offset in relation to the opposition (or complementarity) often referred to today between strategic planning and tactical action (Lanzani 2021).

The indispensable starting point is the one that always leads us to move from the complex palimpsest that we recognise in each territorial context, to adapt or propose innovations in the processes of material construction of the territory (De Rossi and Magnani 2017); moving in particular from the possible encounter between waste, leftovers and new practices of working, living, relationships, partly emerging and partly activated from that world of things charged with the potential of living and of life (Lanzani 2015; Fontanari and Piperata 2017; Fabian and Munarin 2017; Rusci 2021; Viale 2009; Bodei 2009).

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11. Italian social policies coping with fragility: the challenge of continuity in time, space and life pathways

Massimo Bricocoli and Stefania Sabatinelli

11.1 INTRODUCTION: THE ITALIAN WELFARE SYSTEM IN THE FACE OF SUBSEQUENT CRISES

Welfare systems deal, by definition, with fragility, namely with preventing and contrasting the fragility that stems from social needs and social risks. Western countries' welfare systems assumed the shape and features that make up the very concept of welfare state during Les Trente Glorieuses, the 'Thirty Glorious Years' after the Second World War. A basic trait of that period of generalized growth, that contributed to the development and consolidation of welfare protection, was the general stability and predictability of socio-economic conditions and thus the roughly foreseeability – not the absence – of social risks. This allowed the development (and funding) of institutional protection programmes intended to be in operation for a long time, with minor and mainly path-dependent adjustments. The enlargement of social protection was possible thanks to a strong social and political legitimation for the socialization of risks. In its turn, welfare policies contributed to the stabilization of the socio-economic systems. Changes – as risks – were not absent; over the decades significant economic, political and societal transformations took place in Western societies, but these were absorbed into the 'dynamic balance' (Crouch, 1999) that characterized them.

In the mid-1970s, though, convergent and mutually reinforcing economic, social and political changes cracked the pre-existing balance. The deindustrialization process, triggered by the oil shocks, and the shift from Fordism to post-Fordism, changed the premises for the 'mid-century compromise' (Crouch, 1999). The fair stability of socio-economic conditions started to fade away, while the decrease in the legitimation for the socialization of risks made way for an increasingly individualized understanding of risks, of possible

failures, and of consequent needs. This paved the way for a deregulation of employment relations and for a recasting of welfare policies, both at differentiated degrees and in different manners according to contexts. Labour market integration, which had represented the pivotal element of social integration for the whole Golden Age, was increasingly characterized by insecurity. In parallel, concerns were growing about hazards variously linked to modernization – and thus to the role of mankind – and to the accelerated pace of globalization, such as the ecological risks, with a turning point in the Chernobyl nuclear disaster in 1986. Thus, in the last segment of the 20th century, we were already living in societies aware that risk and uncertainty are here to stay (Beck, 1992; Giddens, 1990; Bauman, 2000; Castel, 2003).

On the verge of the new millennium, though, the pace of crises of various natures accelerated. The upsurge of international terrorism and of armed conflicts marked the early 2000s, together with an intensification of natural disasters and growing concerns about climate change and its consequences. The sharp global recession brought about by the financial and economic crises of 2008 and 2011, notably treated with austerity recipes (in some countries more severe than in others), had major impacts on the labour markets and in terms of impoverishment. In late winter 2020, then, the onset of the Covid-19 pandemic and the related measures to contain the contagion (especially the general lockdowns) swamped the economies all over the world. This affected more severely those countries that had been hit particularly hard by the great global recession, and whose economic systems and labour markets had turned out to be less resilient than others, and that were therefore still striving to recover from its effects. The political reaction to this crisis was completely different from the previous ones. Also based on the lessons learnt from the negative spirals that resulted from applying austerity measures after 2008, the response has been an expansionary macroeconomic policy, allowing deficit spending to finance rather robust public measures to support individuals and families, employees and the self-employed, employers and non-governmental organizations (Pavolini et al., 2021). The awareness of increasing global weakness, nevertheless, while the strain to recover was still ongoing worldwide, did not prevent a war from starting at the boundaries of Europe, with major humanitarian consequences and producing a key energy shock with global impact.

Within this global frame, the Italian welfare system, like the other Mediterranean welfare systems, underwent a less complete and partly delayed development during the Thirty Glorious Years, in comparison to Nordic and continental European countries. Large responsibilities remained devoted to families, both in carrying out care tasks (for children, older and disabled people) and in granting income and housing support to family members (especially the young, typically supported by their family of origin for longer periods of time). The Bismarckian core of Italian welfare historically aimed

at protecting the (male) breadwinners, through strictly category-based monetary measures. Those who, although being in need, fell through the mesh of a safety net designed in this way, were left to the assistance of their relatives, if they had any, or of the local governments and/or charity organizations. Other typical features of the Italian welfare systems are worth mentioning here. First, the fact that expenditure towards service provision has always been lower than in other countries, with a strong prevalence of monetary transfers and a residualization of social services (Ascoli and Pavolini, 2015), mainly acting as providers of social assistance rather than actors of social development. Second, the fact that housing policies have traditionally been scant, fostering homeownership – which has long been comparatively high – and that a minimal provision of public housing has been virtually stopped in the last 30 years, and even resources for maintenance have been largely lacking (Belotti and Arbaci, 2021; Arbaci, Bricocoli, Salento, 2021). Third, the remarkable and growing role assumed by third-sector actors, ever since the 1980s, in managing social services, both autonomously run, or contracted out by public local bodies (Ascoli and Ranci, 2002). Fourth, the historical presence of very deep territorial inequalities in welfare provision, with a sharp Centre–North/South divide, but also with notable differences between urban and remote areas. The regionalization of welfare policies, certified in the constitutional reform of 2001, and an increasing role also of local governments (at the city level) were intended, on the one side, to pursue more effective, place-based policy responses, but in the absence of adequate balancing measures they brought about controversial effects in terms of growing disparities in the provision of social protection (Kazepov and Barberis, 2013).

The emergence of new social risks has been challenging all welfare systems, calling for a recalibration of their objectives and, therefore, of the expenditure destination: a complex process, touching upon consolidated practices, vested interests, and thus generating (sometimes sharp) social conflicts. In Mediterranean countries, though, the transition was even harder, since new social risks are better tackled by universal measures than by category-based ones, and typically call for service provision rather than (only) monetary transfers (Taylor-Gooby, 2004; Ranci et al., 2014). Against the backdrop of 'permanent austerity' (Pierson, 2001), countries that had already developed thorough networks of service provision (among others, for childcare, for eldercare, for employment services), proved to have a competitive advantage as opposed to those countries that, at the beginning of the 2000s, still displayed minimal provision and basically had to build service systems almost from scratch (Bonoli, 2007). In this frame, Italy had remained the only European country, together with Greece, without a national minimum income scheme. In parallel, the local infrastructure of service provision, the one people in need who fell out of category-based protection would turn to in search of support,

was harshly jeopardized by cuts to transfers from the central state to local bodies during the great global recession. This reduced resources available for local welfare – also in terms of staff – and interrupted the weakly expansive dynamics of the previous years (Barberis and Martelli, 2021).

As mentioned, impacts of the great global recession on the labour markets were harsh, and poverty rates, both relative and absolute, featured strong growth. One consequence was the possibility to put on the public and political agenda the need to reform unemployment benefits towards a more inclusive system, to finally introduce a national minimum income scheme in 2017, and even – in connection to significant and rapid political turnover – to soon substitute it with a new measure with wider funds in 2019 (Gori, 2020).

Differently from what had characterized the responses to the great global recession, then, when the crisis related to the Covid-19 began, the Italian welfare system counted on a rather generous minimum income scheme, despite several flaws, especially related to the activation mechanisms (Ministero del Lavoro e delle Politiche Sociali, 2021). Additional measures were introduced to cope with the exceptionally hard conditions brought about by the restriction measures. These were, especially, income-support measures and paid leave for workers, and monetary transfers for employers, including the managers of social services (Pavolini et al., 2021). In a country with high indebtedness and low economic growth such as Italy, this was only possible thanks to the radical change of perspective undertaken at the European level, with a new expansive macroeconomic policy permitting an enlargement of public expenditure in a deficit-spending regime. Despite this unprecedentedly large public intervention, though, the pandemic and its implications had major impacts, reiterating and exacerbating inequalities among people and territories (Brandolini, 2022).

Against this backdrop, it is relevant and challenging to investigate and discuss the role that social policies play in the face of fragility, and what constitutes antifragility when it comes to social policies. As we discuss in the next section, we propose to interpret antifragility in social policies in terms of continuity.

11.2 ANTIFRAGILITY AND SOCIAL POLICY: A MATTER OF CONTINUITY?

As mentioned, welfare support deals with fragility, and provides actions and resources to sustain individuals and families who are fragile or to prevent them becoming fragile when social risks hit them. Yet, welfare policies and programmes are themselves fragile. They are exposed to risks that may jeopardize their scope, or even their existence in some circumstances. Scarcity of economic resources and, even more, of social and political legitimacy for their funding, threaten their margin of manoeuvre and over time have led to its

quite significant reshaping. But also the very features of social policy systems, meaning by this both the set of measures and the practices that have consolidated around them, may be the source of fragility of the system itself, as well as of individuals and groups. Particularly, in our view the lack of continuity in welfare support compromises the appropriateness and effectiveness of interventions, opening up the risk of fragility, instead of building the conditions to cope with it. It is, in fact, when support fails although it is needed that the social pact behind social protection gets cracked, if not broken. It is when support is interrupted without its mission being accomplished, that crises – individual or social – are not faced in their consequences, paving the way for major impacts. In the perspective of this book, then, we propose to consider continuity as a crucial feature of welfare support, that allows the development of practices and actions that may support antifragility of individuals, organizations and territories, and that may even be antifragile themselves.

Three elements of attention emerge with force and are worth consideration as key features for an antifragile social policy in terms of continuity: continuity of access/provision across categories of entitlement and life pathways; continuity in space, across administrative borders; and continuity in time, across segments of interventions and of budget.

Conversely, three factors contrasting continuity therefore deserve attention here. A first factor of discontinuity is the segmentation among different categories. Introduced to define conditions and profiles of entitlement, and to organize the specialization of intervention, categorization has become a very consistent principle in the organization and administration of welfare policies and services, defining homogeneous groups (deserving needy people, entitled beneficiaries, traditional recipients), and classifying accordingly both the recipients and the services that deal with them. The primacy of the subsistence of requirements necessary to be included in the supported category over the existence of need, though, causes several paradoxical consequences. Typically, an individual may drop out of the system of support because of a change in their profile, that determines their sudden exit from a category. This is, for example, the case of age. Minors, once they reach adult age, may lose the entitlement to a whole set of social protection measures, starting from housing solutions that had been carefully defined for them. Older people, as needy as they may be, are often not entitled to support until they reach a certain age; which, moreover, varies according to measures.

A second relevant factor of discontinuity is the territorial fragmentation that may occur in the spatial distribution and organization of welfare services and institutions. Devolution is based on the strong arguments related to the virtues of vertical subsidiarity (Kazepov, 2008). Yet, in the absence of adequate tools of territorial compensation, the effects of local welfare policies in terms of

determining differences – if not inequalities – in provision and access, according to the place where the need happens to manifest, tend to be exacerbated.

A third factor of discontinuity that may jeopardize the antifragility of social policies and services is their duration over time. More and more, welfare services are relying on short-term projects and initiatives, and these may be affected by interruptions linked to the ending of funds, or related to abrupt shocks, marking a caesura in service functioning.

The impact of discontinuity in the provision of social protection may be harsh and disruptive on individuals and their life pathways, threatening their capabilities in facing change and sudden shocks. In the perspective of our reflection, setting the conditions for antifragility concerns in a way constructing the conditions for continuity in the co-design and organization of an extensive and inclusive system of services for support and empowerment. In this respect, we assume antifragility as a feature of the system, more than a character of individuals. In this sense, some welfare systems – namely, the Mediterranean ones, for the features described above – are structurally more discontinuous in their action than others. Therefore, Italy is a case in point, and it is particularly interesting to explore examples of continuity/discontinuity in policy programmes in the Italian context.

In the following sections, with specific reference to some emblematic case studies, we discuss how each of the three mentioned elements – (dis)continuity across categories, in space and in time – relates to conditions of fragility and, conversely, under which conditions antifragility can be pursued in each of the three areas.

11.3 OVERCOMING CATEGORY-BASED SEGMENTATION AND REACHING OUT TO NEW NEEDS

Starting from 2011, the new Milano City Administration promoted a significant turn in the governance of local welfare interventions, reinterpreting the best features of the Milanese tradition of horizontal subsidiarity, and recalling a relevant coordination role in the hands of the Welfare Department. Facing the several challenges at stake (a significant decrease of transfers from the national Ministry and the growing and more articulated social needs), the Deputy Mayor for Social Policies launched a thorough process of organizational change that deeply redesigned the local welfare system. Social services had been traditionally organized in pillars, according to a category-based system. Assistance used to be organized and targeted to each category corresponding to a variety of socio-demographic profiles or specific conditions of need. The most important pillars corresponded to households with underage children, the elderly, disabled persons, and adults without underage children. Separated

specialized municipal offices had their own staff and facilities and a dedicated budget. The reorganization process was complex and challenging for the whole staff, and implied managing a significant cultural turn (Bertotti et al., 2017). The category-based articulation was reorganized into three new transversal areas, on the base of three major types of interventions: residential (implying temporary housing solutions), territorial (being displayed at the neighbourhood and community level), and home-based (being delivered and organized at the recipients' home) (*Residenzialità, Territorialità, Domiciliarità*). In parallel, the provisioning system was restructured into two different levels: a first level of universal access, open to all the citizens expressing a need without any filter or category-based restriction; and a second level, consisting of those specialized services and structures to which citizens can be directed when necessary and appropriate. A similar organizational change was developed in other Italian cities, with an orientation to make the local welfare system more responsive and effective in being more transversal and accessible to more articulated social needs and demand. The case of Bologna is particularly interesting for the decentralization and reorganization of social assistance access points at the neighbourhood level (Marani, 2021). Yet, many aspects of the recent Bologna and Milan developments can be traced back to the pioneering and pivotal programme that was developed in Trieste starting from 2005. The 'Habitat Microaree' programme was developed as a partnership between the local health authority, the City of Trieste, and the public housing agency. The programme was aimed at improving the quality of life and health conditions through a reorganization grounded at the micro-territorial level, integrating different fields of action and narrowing the gap between citizens and institutions, while offering more appropriate and integrated responses to their needs (de Leonardis and De Vidovich, 2017).

Within this broad reorganization process, a specific programme was developed in Milan with a focus on the patterns of access to social services. The pioneering programme was awarded funding from Fondazione Cariplo, a prominent Milanese banking foundation, in 2014. The 'Welfare in Azione' (Welfare in Action) funding programme aimed at supporting initiatives developing new forms of welfare services and providing a collaborative action between public administrations, local communities and third-sector bodies (Bricocoli and Sabatinelli, 2017; Bricocoli et al., 2022). The municipality of Milan set up a partnership including 16 local actors (public, private and third sector, and university departments) to develop the 'Welfare di Tutti' (Welfare of/for All) project, which was shortlisted and financed. Welfare di Tutti, later renamed 'WeMi' (an acronym for Welfare Milan and We Milan), targeted the fragmentation of services provision, developing innovative answers to changing social needs while extending the access to social assistance services to a broader range of citizens. A specific focus was on extending and

facilitating access to welfare services for those who may not be entitled to means-tested support, but still need orientation and intermediation to access reliable services through co-payment or out-of-pocket payment. The project focused on home-based services, whose previously scattered and heterogeneous supply was being reorganized through a revision of the municipal accreditation system of non-public providers. The project aimed at testing two significant modalities of access to services. An online platform (www.wemi.comune.milano.it) was created to provide information on all the home-based services delivered by the third-sector bodies and certified by the municipality of Milan. The system was specifically designed to support and facilitate the matching between demand and supply. In parallel, 'territorial platforms' – soon relabelled 'WeMi spaces' – were conceived as hybrid and innovative low-threshold places favouring and providing access to welfare services. The concept was to locate, in different areas of the city, terminals of the welfare department where citizens could find information and support, but also offer their contribution as active citizens. The logic was to be complementary to the online platform, and to contrast the potentially adverse effects of the digital divide and the informative asymmetries that could be produced. Also, they aimed to increase the capacity of social services in detecting new needs, through exposing social workers to a looser setting and supporting citizens in expressing their needs. Starting from two pilot spaces in 2014, 20 WeMi spaces are currently located in different contexts and neighbourhoods in the city of Milan, and significantly contribute to promote innovation in offering new shared types of care and assistance services that are usually provided on an individual basis (that is, babysitters, caregivers, after-school activities), lowering production costs and users' fees, but also supporting the development of social bonds. Last but not least, the appealing and friendly spatial and communication concept that was designed ensured that the outlook and image of the WeMi spaces explicitly conveys openness in the access to social services (Bricocoli and Sabatinelli, 2017; Bricocoli et al., 2022).

11.4 CONTRASTING TERRITORIAL FRAGMENTATION AND BUILDING ON TERRITORIAL RESOURCES

The potential strength of local welfare systems lies in the possibility to draw on the context-specific combination of local resources, to fine-tune answers to needs that may well vary in their features across localities (Andreotti et al., 2012). In the Italian welfare system, though, in absence of effective coordination tools, and in the frame of an incomplete reform of the intermediary institutional bodies (the former provinces), the administrative boundaries among

municipalities tend to become walls that impede the building of solutions across municipal (not to mention regional) borders.

Programmes aimed at supporting access to housing of fragile individuals and households are a case in point. A first mismatch deals with the fact that housing solutions are more affordable in the suburbs and in more remote areas, while work opportunities are concentrated in the big, attractive cities. The latter are also, typically, the ones that display the larger, more consolidated local welfare system, counting on more resources in terms of national transfers, own municipal budget, and – not least – the contribution of third-sector actors and active citizenship, and that can all together dedicate more efforts and attract more resources for social and policy innovation (Sabatinelli, 2016). On top of this, individuals and households who have established a relation of trust and support with the social services in one city are often reluctant to move to another one, as they fear they would lose such support and, at best, it would take a long time to understand how the municipal welfare system works in the new locality. On their side, local administrations may not be ready to ensure rapid support to new residents coming from other cities. The mismatch between temporary and affordable housing supply and opportunities on the job market may, then, foster conditions of fragility and result in significant inequalities.

Innovative policy programmes, though, can take stock of the fact that not only social needs, but also welfare resources do cross municipal boundaries. The 'Temporary Social Hospitality' (Residenzialità Sociale Temporanea – RST) of the Municipality of Milan is a clear example. In 2015 the Welfare Department of the City of Milan reorganized the municipal system for emergency hospitality. A municipal call was launched to third-sector actors willing to make beds, rooms and dwellings available to host individuals and families with an urgent housing need (typically, evicted households waiting for a public dwelling), with monetary support provided by the City (Bricocoli et al., 2016). The result was a wide and diversified pool of residential resources, that crossed not only the boundaries of the city, but in some cases also those of the metropolitan area. This was possible as the third sector actors that did respond to the call, while being based and active (also) in Milan, have structures available that are variously located, and that they receive in diverse ways: through inheritance and donations; through the entrusting, for social uses, of properties confiscated due to organized crime; through the externalization of former public properties, which may include buildings that used to host functions that have been lost over time, and may be located quite far from the city (summer camps, for instance). This 'pop-up' supply (Bricocoli et al., 2022b), while it may jeopardize traditional and top-down approaches to planning the supply of services in time, as we shall see in the next section, at the same time challenges territorial boundaries. In doing so, it calls for innovative and more comprehen-

sive forms of governance that may allow the best use of resources where they happen to be, questioning the significance of administrative borders.

The need emerges, therefore, to rethink the configuration of the governance of housing and hospitality policies, allowing the creation of paths towards autonomy that are not limited within the administrative boundaries of the individual cities, as well as supra-municipal management of fundamental resources such as the housing agencies (Bovo et al., 2022). This would allow greater room for manoeuvre, both on the part of the social workers and on the part of the subjects themselves, in seeking the most effective match between the resources for support (such as education, training, employment, housing), which can be located at different points of the territory, and the specific profile of individuals and households who are building their path to (re)gain independence.

Furthermore, the supra-municipal coordination is also necessary to maximize the potential for innovation that each municipality, each body active in welfare provision, each partnership linked to a project, each social worker, realizes by starting each time (almost) from scratch. Building better conditions for the institutionalization of solutions and tools that have proven to be effective would free up resources for those aspects that really require innovative, customized and/or place-based approaches (Bovo et al., 2022).

11.5 ENSURING CONTINUITY OVER TIME

The three declinations of (dis)continuity explored in this chapter can and often do interrelate and overlap. As we have seen above, the strict definition of a category eligible to support often produces the consequence of an interruption of support after a period because the person's or household's profile does not fit into the category description any more, not because the need has ceased. The transfer of a family or individual from a city to another also may entail a stop to (part of) the support that they were receiving.

Some support programmes, though, are born with a predetermined duration. This may be related mostly to two factors. The first one is the existence of a legally defined duration of support. The main argument typically at the basis of this is the attempt to prevent 'welfare dependence' and to support processes of emancipation of the recipient. The risk, nevertheless, is that the opposite result is obtained, with a 'revolving door' effect. As a matter of fact, the optimal duration of support cannot be standard, as beneficiaries, even if embedded in similar contextual conditions, move within structures of opportunities that are highly diversified depending on many factors (age, gender, nationality, religion, disability, personal experiences, and so many others) that do impact on their possibilities and capabilities to exit the condition of need. Dismissing an individual or household from support before the conditions for

autonomy have been reached may, and often does, pave the way for a longer and even permanent condition of dependency on welfare support.

The second factor is related to the tendency, that has become prevalent in the last decades, to design, fund and develop public policies on a project-based approach (Boltanski and Chiapello, 2006). Targets, rhythms, constraints and schedules of policies and programmes are dictated by the rules of competitive calls. The profile, content and perspectives of social interventions have been increasingly pervaded by such a philosophy, since projects are typically temporary. One main argument supporting this orientation is the promotion of innovation through experimentation. However, such experimental programmes often end up substituting basic support measures that are missing. At the same time, they are also hardly institutionalized and generalized. The risk, therefore, is that experimentations explore possibilities and raise expectations that are bound to be let down as soon as the temporary programme is over or the dedicated resources have been used up, with similar results as the ones discussed above. The risk that is detrimental both at the individual level, that of the single persons or households that have been supported only for a limited period, as well as at the territorial/system level, that of a collectivity that has been denied the possibility to exploit and learn from experimentation, to draw on experience and to count on a (new) instrument of support (March, 1991).

The already mentioned 'pop-up' character of many projects (Bricocoli et al., 2022), which are literally popping up wherever there are good and contingent context conditions (availability of space, local competences, strong community ties), further jeopardize continuity in time. Contrasting the downturns and controversial side effects of a project-based local policy system is currently a major challenge for ensuring continuity over time, and antifragility of local welfare systems. A strong leadership and coordination capability on the side of the public administration can play a key role in ensuring that an overall – yet versatile – policy framework is defined, in which specific actions and projects can be developed as elements to put policy into action, while organizational change is promoted and monitored to ensure long-lasting change. In this respect the above-mentioned WeMi case is quite emblematic: the effectiveness and endurance of an initially experimental project is grounded in the reorganization of the social services municipal system that was being meanwhile implemented.

11.6 CONCLUSIONS AND ORIENTATIONS

In the perspective of this book, we have proposed to consider continuity as a crucial feature of welfare policies, that allows the development of practices and actions that may support antifragility of individuals, organizations and territories, and that may even be antifragile themselves. We have untangled

three dimensions of continuity. First, continuity across categories of entitlement allows the prevention of subjects in need falling into the void at the intersection between one category-based protection scheme and another, or losing their entitlement at the very moment in which their profile changes (as happens to minors when they turn 18, for instance).

Second, continuity across borders limits disparity in provision among localities, contrasting the fact that similar needs receive unequal support, according to the place where the person in need happens to reside. Territorial continuity also allows the pooling of available resources athwart administrative boundaries, so as to bridge segments of support that make sense and to match them with specific profiles of people in need, enhancing their chances to (re)gain autonomy. From the point of view of policies, continuity across borders also refers to the possibility for localities to adopt innovations that have been thoroughly tested elsewhere, by drawing on their institutional learnings, thus maximizing the use of local resources to develop genuine place-based specifications. This would mean not simply reiterating local experiments in new contexts, but rather magnifying the territorial peculiarities, without abdicating from pursuing universalism as a guarantee against inequality. All these considerations highlight the importance of defining an antifragile paradigm in social policies to effectively fight against spatial inequalities and territorial gaps.

Third, continuity in time allows the prevention of interruptions of support that are related to project-based funds and budgets, or to predetermined durations of entitlement, that do not consider whether the conditions of need have in fact been superseded. From the point of view of individual beneficiaries, this may guarantee that they are supported until autonomy is (re)gained. From the point of view of the system of support, this allows overcoming the stop-and-go character of the support provision, as well as the temporariness of resources that it is possible to devote to the maintenance of the system itself, including professional staff and dedicated structures, technology and instruments.

With the end of state monopoly in the provision of welfare support, in order to be antifragile, social policies need to be developed by plural constellations of actors, to be able to draw on the variety of resources that they can contribute to the field. At the same time, for continuity to be assured in the three declinations seen in this chapter, there is also a need for a strong public coordination. This is fundamental to guarantee continuity to the action of non-public actors active in the field of welfare support, while at the same time preventing the risk that they may privilege self-conservation over the public good.

Having discussed what we understand as continuity, and why we propose to interpret it as a condition for antifragility in social policies, we also need to specify what we do not consider as continuity in this definition. First, continuity, as a condition for antifragility in social policies, does not imply that beneficiaries keep on receiving support indefinitely. Continuity, as we

have shown, is a feature of policies and of policy systems. The support should be activated if, when and as for long as it is needed, and should chiefly aim at not being needed any more, by contributing to create and consolidate the conditions for autonomy and independence. Second, continuity, as a condition for antifragility in social policies, does not coincide with conservation, with the reproduction of consolidated modalities of intervention. Continuity as a condition for antifragility needs continuous innovation and reinterpretation, to keep pace with unrelieved changes that will generate ever new gaps in continuity. In this sense, continuity is an aspiration towards an ideal, a tension towards the policy objective of bridging those gaps, thus pursuing antifragility.

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12. Urban heritage fragility and antifragility: Matera and the 2019 European Capital of Culture[1]

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12.1 MATERA'S HERITAGE AND THE 2019 EUROPEAN CAPITAL OF CULTURE MEGA-EVENT

Matera is a medium-small city of 60 000 inhabitants located in the region of Basilicata, in Southern Italy. It is the third-oldest continuously inhabited settlement in the world and the oldest in Europe, founded during the Palaeolithic era. It is renowned as the City of the Sassi, or stones, which are the city's oldest neighbourhoods, comprised of many cave dwellings and churches hewn into the rock face of the ravine that the city is built upon. These rock settlements are noted for being adapted to their geomorphological setting and for a sustainable relationship with the environment (Damiano et al., 1998; ICOMOS, 1992).

Due to the extreme poverty and insanitary living conditions of the inhabitants in the Sassi, after World War II the national government set up a large-scale new housing plan to relocate the Sassi's residents. This made the city a sort of international laboratory for urban planning, but ultimately left the Sassi partially abandoned until relatively recently (Mininni and Dicillo, 2012). In the late 1980s and in the 1990s a resettlement programme sought to encourage people to return to live in the Sassi and restore homes and other buildings, with the support of the national Law 771 of 11 November 1986.

Because of their cultural relevance, in 1993 the Sassi and the Park of Rupestrian Churches were listed as a World Heritage Site by the United Nations

[1] This chapter derives from and includes substantial excerpts and materials from the HOMEE Research report: Ponzini et al. (2020b).

Educational, Scientific and Cultural Organization (UNESCO). In 2014 the city was awarded the title of European Capital of Culture (ECoC) for the year 2019. These two moments were important turning points in overcoming negative stereotypes of the city, as well as working towards the revitalisation of the Sassi area and of other parts of the historic core, in synergy with other national and local policies. At the same time, the increasing tourist pressure raised new socio-economic issues for local residents, and had negative effects in terms of preserving the tangible and intangible heritage of the Sassi and of the historic centre of the city, with many dwellings turned into bed-and-breakfasts (B&Bs) or hosting new activities for mass tourism (Comune di Matera, 2016; Picascia et al., 2017). Within a few years after the awarding of the ECoC title, the properties listed as B&Bs had more than doubled to over 1000 in 2019. Almost half of these are located in the Sassi. Despite the political narrative attached to it, the 2019 mega-event could not act as a panacea for all the problems of the city and region, from decreasing population to the out-migration of skilled and knowledge workers, and reduced economic activity compared to the north of the country.

The 2019 ECoC had a regional scope, and the intention of spreading the effects of the event was made clear in the bid as the event was officially entitled the Matera-Basilicata 2019 ECoC, with 130 other municipalities in the region participating in the initiative.

The relationship between the 2019 ECoC and heritage is complex, as the Sassi hosted a number of events and the organisers also intended to promote other heritage narratives and places beyond the historic city centre. The 2019 event was able to address long-standing regional problems only to a limited extent. Matera's accessibility has been one of the main challenges facing the city, in terms of both growth and development, as well as becoming a mass tourism destination (Baldassarre et al., 2017). The 2019 mega-event was planned within a broader policy framework of urban and regional plans and policies that are worth considering before analysing the plans for the ECoC and their implementation. This chapter provides an analysis of the strategies and planning measures in Matera with a focus on the plans, projects and governance of the mega-event, of its urban effects, and finally, it discusses if and how the mega-event experience affected the fragility and antifragility of heritage areas in Matera.

12.2 STRATEGIES AND PLANNING MEASURES IN A FRAGILE HERITAGE CITY

The context of the 2019 event planning and operations shows several problematic issues of strategic and land-use planning, heritage policy and preservation, as well as of unregulated tourism growth in the historic city centre. The

General Master Plans of 1956 and of 1975 (whose preparation was led by town planner Luigi Piccinato) established the structure of contemporary Matera. The 1999 General Modification to the 1975 plan was approved only in 2007. The new plan was approved only in April 2018, based on a 2013 document that did not consider the 2019 event and its urban implications. Rapidly growing tourism and its effects on the city centre were not addressed in a consistent and comprehensive manner. In particular, specific regulations and guidelines were recently introduced in the Sassi area to begin to deal with accessibility issues, and the management of a massive influx of tourists in a fragile and layered urban fabric. In addition, the Integrated Territorial Investments Strategic Document, approved in September 2018, earmarked total funding of €43 million with the aim of reinforcing 'the role of the City of Matera as a tourist and cultural magnet, pursuing sustainable urban development based on the knowledge economy, innovation, quality of urban space and the enhancement of social, cultural and environmental capital' (Città di Matera, 2018, p. 2, translated by the authors).

The first Strategic Plan of the City of Matera (Comune di Matera, 2009) was developed under the leadership of architect and urbanist Francesco Karrer and completed in 2009. The plan included the analysis of the city and its surroundings, and a series of proposals that were not implemented. The City Council, with the support of SVIMEZ (a prominent non-profit organisation dedicated to the economic development of Southern Italy), intended to create a Strategic Plan for the period 2018–2020, but never finalised the document (Comune di Matera, 2017a). The City Council also created a list of projects to be completed in anticipation of the event, but this was not part of a comprehensive plan for the city's development (Comune di Matera, 2017b; 2018a).

The two ECoC bid books tried to outline city-wide strategies, but they never had the technical and political legitimisation to do so. Tourism development plans or policies made very little or no contribution to handling the expected increase in tourist numbers at local and regional level. The planners of the ECoC predicted a 200 per cent increase in tourists by 2020, which the city did eventually achieve. The lack of systematic preparation to manage tourism was clearly recorded during interviews and fieldwork and it emerged as one of the key issues during 2019. This clearly impacted upon Matera's heritage.

The UNESCO Site Management Plan (SMP) (Comune di Matera, 2014) was created in 2014, and led by a group of local researchers and architects who included Angela Colonna and Domenico Fiore. A major component in the creation of the plan was a series of public participation workshops that involved local residents. A Permanent Observatory was proposed for the future maintenance and protection of the Sassi. While completed at nearly the same time as the city was awarded the 2019 title, there was no mention in the document of the ECoC bid, and of the implications of Matera's designation as ECoC for

the city's heritage. Likewise, the first ECoC bid book (completed in 2013) did not mention the SMP and how the two documents might inform one another. The proposed Observatory is not yet fully operational, and only a small group of key stakeholders have been consulted. None of the projects proposed in the SMP have been implemented.

12.3 THE MEGA-EVENT AND MATERA'S HERITAGE: PLANS, PROJECTS AND GOVERNANCE

The Matera-Basilicata 2019 ECoC has been at the centre of analyses and debate in Italy (see, e.g., Argano and Iasevoli, 2014; Bencivenga et al., 2016; Bernardo and De Pascale, 2016; Fusco Girard et al., 2017; Matera-Basilicata 2019 Foundation, 2020; Percoco, 2018; Fox et al., 2020; Mininni et al., 2020). Some heritage-related issues have been touched upon by existing publications. This chapter offers a distinctive contribution because its main focus is the relationship between the planning of the mega-event and Matera's heritage.

The process of planning and implementing the mega-event and its legacy can be summarised in five main phases. During the first phase (2009–2011) the idea of bidding for the event emerged and the mobilisation of institutions and organisations started. The second phase (July 2011 to October 2014) structured the official proposals (the first and second bid books) and led to the third phase (October 2014 to February 2016) of actual planning of the event. The fourth phase comprises the implementation of the event (October 2016 to December 2019), while the design and delivery of the legacy (from 2020 on) went through a period of significant uncertainty due to limited planning and the unpredictable Covid-19 pandemic.

The two bid books for the ECoC (the original one submitted in 2013 for the initial shortlisting, and the second version submitted the following year by the team representing Matera as one of the six finalists) show an important shift in the focus of the mega-event: from heritage-centred to technology-driven. The first bid book used the city's heritage as a symbol of the citizens' spirit and resilience. Heritage was depicted as a motor for new creative enterprises (Matera 2019 Committee, 2013). Some restoration projects for historically or culturally valuable buildings were mentioned specifically, including Mulino Alvino, Castello Tramontano, Complesso del Casale, La Martella neighbourhood and the DEA (Museo Demoetnoantropologico di Matera) ethnographic museum to be located in the Sasso Caveoso.

Conversely, there was not a strong emphasis on built heritage in the second bid book (Matera 2019 Committee, 2014), though the intangible heritage/identity of the city is seen as central to the development of the proposal. The core theme is instead to create an 'open future' for the city by bringing together

Matera's rich source of open data and a future of cultural production. While cultural heritage is noted as having served as an attractor of tourism in the past, the bid proposes to use the event to go beyond just attracting tourism, by testing radically new approaches that challenge the tourism-based economic model. The Open Design School (ODS) and the I-DEA exhibition project are framed as the two cornerstones of the bid and of the mega-event's legacy.

The bid books contain few heritage-specific projects. Of those, some were completed as part of the year, while others were cancelled or modified, mostly due to governance complexities. For example, 'Ars Excavandi' was proposed as the opening exhibition, which was intended to take place in the Palombaro Lungo, the city's largest historic cistern, and would focus on the art of excavation in clear relation to the city's peculiar urban fabric. The location was moved to the Archaeological Museum and the relationship with the city's heritage was redefined. Among other projects, 'Caring City' would have created 'sensory trails' through the Sassi, designed in cooperation with architects and city planners, while 'Open House Matera' would have showcased the architectural heritage of the city by opening, for one weekend of the year, spaces which normally were not accessible to the public. These events did not take place, for a number of reasons, ranging from delays in the availability of funding to logistical issues and lack of permissions from the institution in charge of preservation.

A number of restoration/transformation projects can be found in the bid book, as presented in Table 12.1. Among these, only the New University Campus and the Restoration School were completed as originally envisioned and on schedule for 2019. Both of these projects were planned and funded outside the scope of the 2019 ECoC. While both the I-DEA exhibition and the ODS were provided with spaces, neither of those were located in the Sassi as originally proposed. While the heritage narrative formed an important base for the bid, the majority of the proposed projects/events had relatively little to do with the city's heritage, and many were ultimately not implemented as originally conceived. While the bid book did heavily promote the city's future as an open and digital city, it did not actively address the city's heritage in terms of the innovative re-use and re-activation of abandoned spaces.

The majority of the proposed heritage-related physical projects were not completed as planned for the event, or were relocated to other areas of the city, with the exception of the new University Campus. This was the case with both I-DEA and the Open Design School, the two pillar projects of the year, which were originally to be located within the Sassi and ultimately located elsewhere. One of the most important projects carried out by the Matera-Basilicata 2019 Foundation was the completion of a new theatre venue created within the Cava del Sole former tufa quarry, which hosted a handful of larger events throughout the year including part of the opening ceremony. While this project represents

Table 12.1 Heritage-related project presented in the bid books and their implementation

Heritage-related bid book projects	Realised?
Open Catasto project	Yes
Lumen event	Yes
Invisible Pavilions event	Partially
Living the Opera event	Yes
Ars Excavandi Exhibition	Partially
Playspace event	No
Instant Architecture event	No
Caring City event	No
Open House Matera event	No
I-DEA exhibit space in the Sassi	No
Restoration of the Casale Complex	Yes
New University Campus	Yes
Restoration of Cava del Sole	Yes
Restoration of La Martella Theatre	Partially
Relocation of L'Arca di Promoteo	No
Citadel of Space	No
Greenways and crossroads stations	No
Creation of the Advanced School of Restoration	Yes

an important re-use of an abandoned quarry, it has remained difficult to access, with only limited public transport options and safe pedestrian routes.

Heritage sites were distinctive settings for a number of events. The Sassi's appeal and iconic value were, and still are, central to the image of the city. As Figure 12.1 shows, many event locations were clustered within the historic city centre and throughout the Sassi area.

However, the aims to creatively use heritage for the mega-event were largely redirected or impaired, largely due to institutional complexities and fragmented administrative powers and procedures. Many projects were redirected to areas outside the historic city centre, and stimulated the use of, and the discussion about, tangible and intangible heritage (the examples of the ODS and of the I-DEA exhibition are cases in point). Figure 12.2 shows that the mega-event's activities had fairly limited effects on the materiality and use of the core heritage areas.

A number of infrastructural projects, including road improvements, the creation of new parking spaces and, most visibly, the new central train station, as well as a number of heritage restoration projects, were also completed.

Source: Zachary M. Jones.

Figure 12.1 *The opening ceremony of the Matera-Basilicata 2019 ECoC in January 2019, with marching bands from across Europe and Basilicata at the Cava del Sole*

By the start of the 2019 programme, restoration works were completed for the Cathedral, the Mulino Alvino complex (though its use was changed from a museum to a hotel and resort), the Ex Carro Factory and the Cava del Sole. Some street improvement projects within the historic centre were also carried out.

In terms of governance, the Matera-Basilicata 2019 Foundation has relative autonomy from the local municipality, though the financing mechanisms tie the two organisations together. While the 2019 Foundation has created some partnerships with other stakeholders, there is an overall lack of integration in planning and implementing projects with other pre-existing organisations and institutions. Several other cultural organisations prepared their own cultural events during the year, separate from those of the Foundation and not promoted or advertised by it. Additionally, the municipality developed its own set of goals and legacy projects separate from those of the 2019 Foundation. While the regional Museum System (part of the Ministry for Cultural Heritage and Activities, MiBACT) was heavily involved in organising one of the four main exhibitions for the 2019 programme, other institutions such as the Restoration School and the UNESCO Chair in Cultural Heritage at the University of

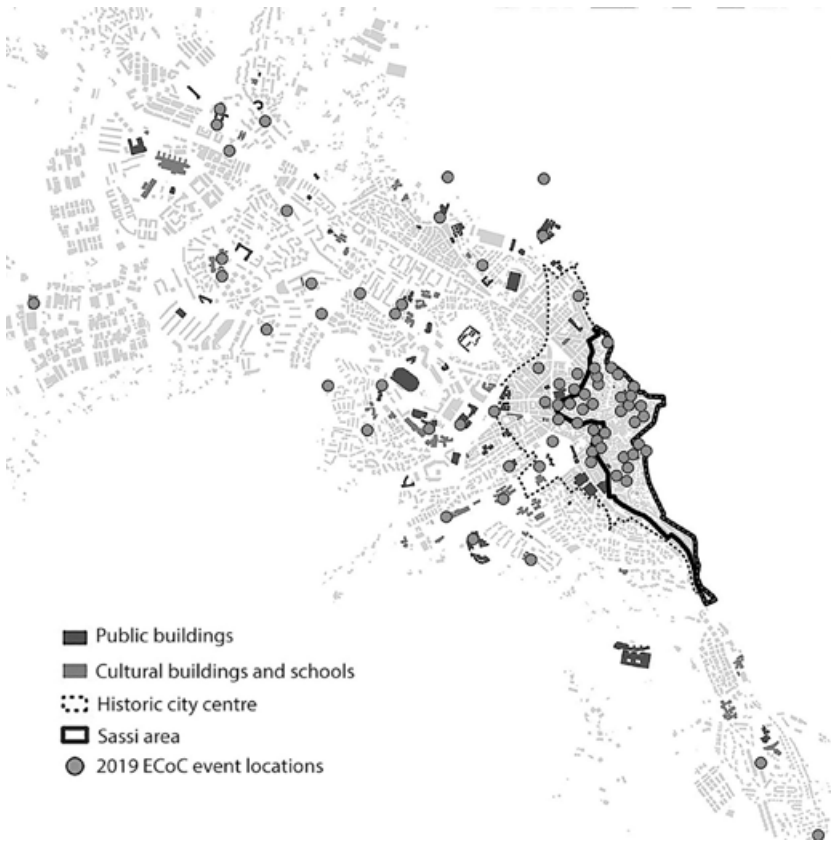

Figure 12.2 Map showing the 2019 ECoC event locations in relation to the city centre as well as cultural and public buildings

Basilicata did not have any official connections with the event or the 2019 Foundation. None of the physical restoration projects described within the bid books were under the control of the 2019 Foundation; in most cases the municipality played a key role, in collaboration with MiBACT. Due to frictions between Matera City Council, the Region and the 2019 Foundation, and due also to Italy's governance complexities, there was not close coordination between public works to restore historic sites and their use within the 2019 programme.

The Municipality had a mostly conservative position, directing most of the funds at its disposal towards interventions aimed at the re-use and restoration of existing heritage assets (Rupestrian Churches Trail, Palazzo del Casale,

Cava del Sole, Tramontano Castle, refurbishment of the Convent of Santa Lucia to create a home for the School of Restoration, Municipal Theatre, Auditorium in Palazzo del Sedile, hypogeum spaces in piazza Vittorio Veneto and piazza San Francesco), rather than at the construction of new cultural facilities (Comune di Matera, 2018b). Construction work started in the cases of some important infrastructural interventions, which broke the impasse thanks to the mega-event's hard deadline (for example, the FAL Railway Station, the state freeway SS99 Matera–Altamura–Bari, the intermodal terminal in the Serra Rifusa neighbourhood, parking areas, the renovation of streets and squares such as Via delle Beccherie, Via San Biagio, Piazza del Sedile, Piazza San Giovanni and Villa Comunale). However, in some cases, completion of the projects was delayed until after the inauguration of the 2019 ECoC.

12.4 URBAN EFFECTS AND MEDIUM-TERM UNCERTAINTY IN A FRAGILE HERITAGE AREA

In considering the mega-event–heritage nexus, the Matera ECoC can be interpreted both as an opportunity to make the historic city centre stronger, more resilient and diversified in its economic base, as well as a threat. In other words, one can try to assess whether and how the effects of the mega-event made heritage more or less fragile and, conversely, antifragile. In particular, this chapter highlights the material and functional aspects of the Sassi area, the governance of its spaces as part of the city of Matera and of a broader territory, their use as part of the mega-event, and wider implications in terms of tourism and gentrification.

Both bid books had the intention of strengthening the city's development trajectory over the long term. The first tried to put both tangible and intangible heritage centre stage and to strengthen the economic, social and cultural activities connected to it. One of the potential effects was to make the historic city centre and the Sassi area less prone to the negative effects of mass tourism and, over time, to gain strength from the presence of more diversified tourism. The second bid book envisioned technology as a driver to make the city a platform and an engine for the development of the region, but without giving any specific role to the city centre. However, one could expect that an economic system which relied on culture and creativity rather than on heritage tourism may relieve the historic city centre from excessive pressure. The shift from the first bid book to the second, in terms of placing less and less emphasis on the built environment and inner-city target places, seems largely due to the complexities of governance and regulation when dealing with cultural heritage in Italy. The spread of the events and the uses of intangible heritage in the 2019 programme appear to confirm this observation. In principle, the mega-event

plans of the first bid book aimed to make the heritage areas more resilient – and to some extent more antifragile – by diversifying their economic and social connections. The second bid book limited itself to aiming to avoid excessive stress for the built heritage of the historic city centre.

However, significant failures in completing heritage-related projects as well as other interventions located in the city centre dramatically limited the impacts of the Matera 2019 strategy. On multiple occasions, the local Soprintendenza (the area office of MiBACT, responsible for heritage preservation) slowed down and even halted some projects, as they were deemed to be harmful to the city's heritage. One such example involved an art installation that would have seen ropes strung across Matera's ravine, connecting the city centre to the Murgia Materana Regional Park. The Sopritendenza argued that it had not been involved early enough in the process of designing this artistic project to identify possible alternative solutions.

Several existing cultural organisations and institutions, in addition to the 2019 Foundation, also organised events to take place during 2019. These projects were outside the official 2019 programme and they were not promoted by the Foundation, so visitors coming to the city would not easily have found information about these events. Several of these events were sited in heritage locations in the city. While some of these events were promoted by the Tourism Agency of the Basilicata Region, they were not clearly connected with the programme of the ECoC. Also for this reason, heritage governance benefited little from mega-event planning and implementation. More generally, despite the significant opportunities and perhaps due, in part, to political instability, the ECoC could not overcome long-standing institutional fragility and limited networking capacity in the heritage field and in the wider cultural sector.

The 2019 ECoC was an important turning point for the city of Matera and a moment when several mega-event and urban planning measures became more evident (Matera-Basilicata 2019 Foundation, 2019). One can assess their contribution to the fragility and antifragility of the heritage of the historic city centre by discussing the implications for tourism, gentrification and the uses of this area.

The opportunity to strengthen the historic city centre in the face of the massive growth of tourism that occurred until the end of 2019 – with a trend to growth that was consolidated as soon as the city was awarded the ECoC title in October 2014 – was missed, as no systematic tourism management or sustainability plans were produced, despite the clearly stated goals of expanding tourism. As we argued in the previous sections, this led to complications in terms of accessibility and tourism overflows during the early months of 2019, as well as during the peak tourism and holiday seasons. However, the majority of visitors came to Matera to appreciate the impressive heritage of the Sassi rather than to take part in ECoC events. According to the 2019 Monitoring

Report (Matera-Basilicata 2019 Foundation, 2020), approximately 293 157 non-locals participated in events during the ECoC year. However, there was a total of 730 434 stays in 2019, meaning that less than half of the total number of overnight visits attended or participated in events as part of the 2019 ECoC.

Given the turbulence introduced by the Covid-19 pandemic since 2020, it is as yet unclear what the long-term legacy of the 2019 ECoC will actually be for Matera. The ODS and an online archive of I-DEA projects have been proposed as potential continuations of events that took place during 2019 itself. During the pandemic there was a dramatic drop in tourist numbers and in attendance to heritage and cultural places, as well as general limitations to cultural and public life.

A clear long-term impact on the city's heritage can be seen in the Sassi where there was a significant increase in the presence of B&Bs, hotels and restaurants. While on the one hand this has brought about the improvement and reutilisation of structures that were previously abandoned or uninhabitable, it has also led to high numbers of tourists in this part of the city, and gentrification effects. This issue was also coupled with insufficient provision of ancillary facilities to support much higher tourist flows. The newly created UNESCO Site Management Plan did not anticipate these potential changes. Neither the SMP nor any other planning policies were able to respond to these fast changes in real time. It is also worth considering the role of the local tourism model, and the way in which the ECoC was presented as a crucial opportunity to support the local economy through the growth of the tourism sector. From this perspective, the risks associated with touristification were exacerbated by the fact that the local tourism industry consists mostly of small or family businesses, who invested heavily in the restoration of their properties in the hope of benefiting from the ECoC effect on tourism. Growing tourism pressures on the area suggest that the Sassi may be experiencing, as suggested earlier, 'heritage-led gentrification' (see, e.g., De Cesari and Dimova, 2019), where heritage contributes to rising land values and where the original population is replaced by tourism entrepreneurs and visitors.

At the time of writing (end of 2022), it is difficult to say what the implications of discontinuous tourist fluxes may be for the long-term management of the city. Local actors and public institutions found difficulties in driving the legacy of the ECoC, as this task is outside their scope and the mega-event delivery vehicle could not readily be converted into a long-term legacy company. As a result, the tardy legacy policy did not prompt special interest in heritage and long-term policies for its preservation and mobilisation. In addition, the skills and capabilities developed locally in relation to heritage conservation, and the delivery of large-scale cultural events, are at risk of being lost, as most experts and trained workers are not retained as part of a legacy plan. Policy makers in Matera could not strengthen the overall potential for improving cultural

and heritage management that the ECoC provided, in order to make the city's heritage assets more antifragile and less fragile.

12.5 CONCLUSIONS: MEGA-EVENT PLANNING, HERITAGE FRAGILITY AND ANTIFRAGILITY

As the oldest continuously inhabited urban settlement in Europe, Matera represents in many ways a heritage-rich city and shows the complexity of discussing the heritage–mega-event relationships. The event heavily referenced the city's heritage, which, based on our observations, absorbed most of the visitors' attention despite the aims to diversify the city's image and activities. The mega-event's planning and delivery undeniably contributed to improvements (for example, in terms of accessibility and the creation of new public spaces). However, the impressive heritage of the city was not systematically integrated into the ECoC's programme as other ECoCs did in the past (see: Jones, 2020). Ultimately the 2019 ECoC did not have a significant long-term impact on the use and governance of the city's heritage. At the same time, heritage policies did not interact much with the mega-event, as for the UNESCO site, and did not respond to the mega-event's plans and projects. While keeping the focus on the heritage–mega-event relationships, there are more general considerations that can be derived from this case study in terms of epistemology, the fragility–antifragility continuum and uncertainty over time.

Although the epistemic question of how to investigate the effects of mega-events in heritage-rich cities in terms of fragility/antifragility has not been the main target of this chapter, one can clearly see that better and more usable knowledge can derive from a more in-depth understanding of the interplay between social and material features as they assemble in place (Farías and Bender, 2010; Lieto & Beauregard, 2015). In the case of Matera, the size and materiality (e.g. the built environment and its uses) of the Sassi area have characteristics that significantly influenced the planning of the event and its infrastructure. The research from which this chapter derives (Ponzini et al., 2020b) did not consider the materiality of the heritage areas, but a dedicated analysis may enrich such discussion in the future. This analysis should consider a longer time frame than that adopted by this chapter, as the complex entanglement of social activities (such as cultural events, tourism and related uses of urban spaces) and local conditions are very hard to affect, as they depend on the actions of a plurality of institutions and on long-term policies. Heritage regulations typically stand on the assumption that built heritage is materially fragile, and that increasing its uses exerts pressure, and risks making its preservation more difficult over time. The materiality of heritage areas and the potential of making such complex urban systems more antifragile by means of extended (and perhaps more diversified) uses have not been adequately

explored in the literature nor in policy making. Clearly, the epistemology question has significant implications for planning practice.

This case study also shows that making a clear-cut assessment of how certain plans and projects affect the fragility or antifragility of a complex urban area is challenging. In the case of Matera this has not been possible, as a more nuanced continuum emerged, at least in two ways. First, the individual measures included in a plan such as the one for the ECoC in Matera may make the heritage more or less fragile or antifragile to different degrees, and may include interactions and other ways to counterbalance negative effects. The difficulties found in implementation make this exercise extremely hard to perform *ex ante*. Second, the fragility and antifragility of heritage areas may shift according to different conditions over time. The Covid-19 pandemic changed the situation quite abruptly, and increased uncertainty about the future of Matera's heritage.

The strengthening of institutions and networks may be a way to improve the situation over the long term. However, in a cultural policy field such as heritage where a high number of actors and regulations are in place, less opportunities for change mean lower risks, and vice versa (Jones & Ponzini, 2018). In this sense the limited impact of the mega-event's planning may depend on the intention of not affecting the policy powers and the political balance, while taking opportunities and distributing resources to organisations and projects where there were fewer potential frictions (Ponzini et al., 2020a; Ponzini & Jones, 2021). This conservative position reduced the mega-event's potential for experimentation (Ponzini et al., 2019).

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13. Governing the commons on an Aegean island: the management of water resources on Sifnos, Greece

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13.1 INTRODUCTION

Garrett Hardin's 1968 article in *Science* on the 'tragedy of the commons' (Hardin 1968) popularised how a scarce resource may be eventually depleted if it belongs to no one in particular ('a pasture open to all'). The over-exploitation of cod stocks in the North Atlantic from the mid-1950s, causing their virtual disappearance in the early 1990s, and the resulting death of the fishing industry which had sustained the livelihoods of the United States and Canadian fishing communities for 300 years, is merely one example. (See also Fehr and Leibbrandt 2011.)

The original response to the Tragedy of the Commons was to view it as a problem of poorly defined property rights (Coase 1960). When a resource is collectively owned, and access is unrestricted, individual users pursuing their short-term self-interest end up harming the community's long-term collective interest. By seeing the problem as stemming from the poor definition of property rights, two alternative solutions arose: (1) public ownership and regulation, whereby the government sets and enforces limits (via quotas, penalties, access rights, and so on); or (2) conversion to private property, that is, privatisation of the common resource, providing the incentive to the (single) owner to eliminate excess use in order to maximise profit. The two solutions can be shown to yield identical results in terms of the elimination of excess use, though of course they may differ greatly in terms of their distributional implications.

Elinor Ostrom's book *Governing the Commons: The Evolution of Institutions for Collective Action* (Ostrom 1990), which won her the 2009 Nobel Prize in Economics, established a third solution. Reviewing a great variety of historical examples, she demonstrated that small and stable communities have long been able to devise creative, effective and resilient local systems of rationing access

to scarce resources, drawing upon locally evolved norms of reciprocity and trustworthiness. In particular, Ostrom's analysis of the *huertas* (fertile irrigated areas) of Valencia, Murcia, Orihuela and Alicante, whose origin went back to the early 15th century, showed how local communities devised ingenious irrigation institutions for granting farmers access rights, and for enforcing the sustainable use of scarce water resources.

Our research showcases a little-known example of a locally devised system of equitable and sustainable access to scarce water resources in Poulati, an area on the Cycladic island of Sifnos, Greece. The system was established in the Byzantine era, was allowed to persist under both the Venetians (1207–1617) and the Ottomans (1617–1821), and is still practised today, albeit under constant threat from the growth of tourism. The system consists in a set of rules, formal and informal, rationing local farmers' access to water, regardless of the location of springs and cisterns, which often lie within the boundaries of private plots of land. This chapter, drawing on fieldwork, traces the past and present of the Poulati system, describes its workings, assesses its performance in the light of Elinor Ostrom's 'design principles of long-surviving, self-organized resource regimes' (Ostrom 2000), and concludes with a reflection on threats to the system's survival in a rapidly changing context.

13.2 THE AREA OF POULATI

Poulati is a valley with a partly dry riverbed situated on the eastern coast of Sifnos, a Greek island in the archipelago of the Cyclades, in the Aegean Sea. The island extends over an area of 74 km^2 and has a population of 2755 (ElStat 2022). Archaeological evidence points to a long history dating back to the Mycenaean era (1750 BC to 1050 BC). It features a strong local community: traditions are kept, dozens of winter feasts take place at churches on their saints' name-days, inhabitants like to meet and share stories. In recent decades, Sifnos has become a thriving tourist destination, receiving thousands of visitors every summer, including an international community who have made the island their second home.

Poulati takes its name from the monastery, built in 1872. Originally, the area was known as The Garden, although today most people refer to the whole area as Poulati. The terraces and fields irrigated by collectively managed water resources cover an area of approximately 15.5 hectares. The plots that are still cultivated, owned by a small number of persons, cover less than 6 per cent of the area in question, corresponding to approximately 1 hectare. Owing to geography, and small plot size, the kind of agriculture practised in Poulati is strictly non-mechanised. From above, the area looks like a green vein that descends to the sea between narrow and long terraces that cross it like ribbons in a stair-like fashion (Figure 13.1).

Source: DECA Architecture.

Figure 13.1 Poulati, Sifnos

There are nine known water springs running along the green vein of Poulati, their flow varying by the season and by the year. The altitude of the water springs ranges from sea level to 140 metres above it. Locals consider water to be a common good, no matter where the spring happens to be located, whether on private or public property.

The water from each spring is collected in stone tanks, built alongside the riverbed, each one a little lower than the next, using gravity to get water to run through small irrigation furrows. There are over 30 such stone tanks of various designs, ranging in size: ten or so are small troughs (*γούρνες*), sized about 3 m^3 each; the remaining 21 are open-air cisterns of about 15–20 m^3 each. Sifniots call them dumps or cesspools (*χαβούζες*), although the water collected is not as filthy as the word suggests.

In fact, some cisterns are very beautiful, with pillars once used to support vines that created natural shade, presumably to delay water evaporation. Most are stone-built, some V-shaped on one side like an arch. Some are whitewashed and look well kept, while others are dry and no longer in use. Their shape and position seem to be in harmony with the descending flow of the riverbed and the stair-like terraces. They are embedded into the hand-built environment of

dry stone walls (*ξερολιθιές*) and ribbon-shaped terraces supported by tall stone walls (Figure 13.2).

Some cisterns, known as communal, irrespective of whether they are located on public or private property, are more important than others: their water flows directly from a spring, and then on to other cisterns lying further down the slope. Of the 21 open-air cisterns, five are communal. Other cisterns, termed secondary, are typically smaller, fed with water from a communal one.

Source: DECA Architecture.

Figure 13.2 Poulati, Sifnos

The cisterns are connected through a web of century-old stone-built small irrigation furrows distributing water from the springs. These are still visible, though no longer in use, having been replaced by plastic water pipes; the abandoned furrows are now filled with earth and branches. Among those that are still in use, one can admire the efficiency and resilience of their stone construction. The locals call a water furrow *κουτέντο* (*kouténdo*), a word most likely deriving from the Latin *contentum*, past participle of *contĭnēre* (meaning to contain, to preserve, to maintain).

Terraces are linked by stairs that allow one to climb up and down, revealing the need for regular movement, probably for cultivating and farming the small plots as effortlessly as possible, on an otherwise steep incline down the valley. Tall stone walls separate narrow terraces from one another. The area around the valley is U-shaped, opening down to the sea, with several footpaths circling it at different altitudes. Footpaths circle the terraces and allow for even more regular connection between different properties. Beautiful old wooden doors mark the entrances from footpaths to properties.

The built environment is remarkable for its efficiency and resilience. Over the centuries, these walls have been built and re-built numerous times in the same way, by hand, with techniques passed on from one generation to another. Every year, heavy rainfall or land erosion may destroy parts of the dry stone walls. When this happens, it is the top terrace landowner's responsibility to fix it. On public property, re-building a wall is a community activity. The highly sophisticated knowledge of hand-built dry stone walls is reflected on the richness of the vocabulary: locals use more than 30 different words for stone.

Infrastructure maintenance is necessary to keep the system running. Terraces were built to save every inch of soil from natural erosion and for creating vegetable plots; water furrows, stairs to move easily from one terrace to another, footpaths, gates and dry stone walls were all included in the maintenance responsibilities of the wider exchange system. In the steep Poulati valley, hand-built stone infrastructure amounts to a volume of 21 000 m^3. (For a sense of scale, the marble used to build Rome's Colosseum is estimated at 100 000 m^3.)

The area is divided into 34 properties irrigated by the valley. Properties follow the shape of the terraces: they look like long and narrow ribbons, with most of them, although not all, connecting to the valley. The owners fall into three groups: (1) absentee landlords, whose property is practically abandoned; (2) non-farmers, who use spring water for drinking and washing, not for farming the land; and (3) farmers, who irrigate their plots with spring water.

The largest part of the irrigated area belongs to one of six Sifniot families, owning the land for many generations (Georgoulis, Gozadinos, Baos, Vourdakis, Vernikos, Maridakis). Of the old local families, only two number at least one member who still farms the land in the traditional way.

Another four proprietors are 'foreign', brought in by members of these local families: two are Greek (Chatzigiannakis and Nahmias, who bought land in the area in the 1980s), one Dutch (Frank Greiner, whose brother Onno entered Poulati in the 1970s), and one British (Helen Fost, who joined in the 1990s). The four non-local proprietors own less than 2.0 hectares combined.

Of the 34 properties, six feature summer houses, five are still farmed, while the remaining 23 are abandoned-looking plots or olive groves. As explained later, unused water rights allocated to the abandoned plots are used by those

farming their plots as and when needed. In terms of size, 14 of the 34 properties are larger than the 0.4 hectare threshold, which qualifies them for a building permit (subject to certain further constraints). Of these 14, as mentioned above, summer houses already exist in six; most of the remaining eight seem eligible for obtaining a building permit. Of the 20 properties that are under 0.4 hectares, some feature stone shacks (*θημωνιές*), qualifying them for a maintenance permit, which raises their commercial value.

The next section mainly draws on our interviews with 13 landowners and six of their relatives, conducted between October 2021 and October 2022. (Our main informant, Thomas Gozadinos, a local landowner who was also a medical doctor, much respected by all in the island for his culture and kindness, sadly passed away at the age of 80 in June 2022.)

In addition to that, we have also inspected land sale contracts deposited with the local notary, often containing clauses on water rights. Moreover, we have parsed books and articles for information on the history of Poulati, often written by amateur historians with local roots.

Furthermore, we have been able to exploit the infrastructure analysis and drone photography carried out by DECA Architecture in the context of STARTS4Water, a collaborative project promoting sustainable water management in six countries, funded by the European Commission Directorate General for Communications, Networks, Content and Technology (DG-CONNECT). The goal of the project was to explore whether a joint approach of the digital with the arts could 'help induce behavioural changes in our mind-sets, on a business' and even 'on a policy level'. The project was completed in October 2022, after an artwork depicting the Poulati area, and how the water system worked, was installed in the main island square for the duration of the summer season.

13.3 POULATI'S WATER-SHARING SYSTEM

How is water shared between landowners? Spring water runs to the plots lying below its outlet through a main open-air cistern that collects it and then distributes it in turn accordingly. We located five such cisterns (near springs 1, 3, 5, 6 and 7 in Figure 13.3), situated at nodal points. Most interviewees insisted that 'no matter where a spring lies, public or private property, its water belongs to everyone'. Each landowner draws water by opening the outlet that leads to their own cistern for the agreed amount of time. The time each outlet remains open is measured in 12-hour spans. This water-time is referred to simply as 'water' (as in 'x waters per week').

Until the early 20th century, water-sharing agreements were unwritten, compliance based on trust. It was about then that water rights began to be spelled out in land sale contracts and inheritance deeds. In the words of Ioanna

Source: DECA Architecture.

Figure 13.3 Poulati, Sifnos

Theodorou (born Rafelletou), a landowner of a plot inherited from the Baos family, 'the choice between written and unwritten is that properties that have a water spring or a collecting communal cistern do not need to mention water rights. It is the properties that draw water from them that have water rights spelled out in contracts'. For instance, Frantzeskos Kroustis, descendant of the Georgoulis family through his mother (married Krousti) owns the communal open-air cistern that fills up with water from the highest-lying spring, known as 'The Red One' (*του Κόκκινου*), marked 1 in Figure 13.3, in view of which his access rights are not mentioned in the contracts. Helen Fost, who finally bought land in the mid-2010s, reported that she made sure that 'water rights written down in previous contracts, allowing for water twice a week from Kroustis' communal cistern', were included in her purchase contract. Access agreements are tied to the land irrigated by the springs (and cisterns), not to the owners who inherit water rights (and obligations) as properties change hands.

Water-sharing agreements specify not just the number of 12-hour spans, but also the day of the week. Water rights also include access to overflows and drain-offs (*στραγγίδια*), thus ensuring that 'no water is ever lost', as most interviewees stressed emphatically. These rights are not mentioned in the contracts:

they remain as oral agreements based on trust. This is the case of water flowing from the Red Spring through Kroustis's cistern to a plot owned by Frantzeskos Georgoulis, where the second spring, marked 2 in Figure 13.3, and a secondary cistern are also located.

Water rights are more formalised in the case of the communal cistern, filled by the fifth spring in altitude, marked 5 in Figure 13.3, also known as 'Flea' (or 'Vein'). The cistern is treated as communal, even though it is situated on private land. This cistern gives 14 waters to plots below, shared by five different families of landowners. Its flow is steadier and larger than others. The water rights to this cistern are mentioned on the contracts of the landowners involved.

A mix of written and unwritten arrangements applies to the cisterns just below the communal one, under the berry bushes, filled by a spring marked 6 in Figure 13.3. Two water cisterns, an open-air and a closed one, belong to Giorgis Gozadinos, son of Thomas. Water overflows are directed through a plastic water pipe to another cistern, two terraces below the water spring level, on a plot owned by Frank Greiner, the Dutch landowner. Frank's contract states that he has 'the right to receive water once a week from the neighbouring land ... now belonging to Giorgis Gozadinos'. The exact nature of the water right is not specified, though both parties accept that it amounts to one water (12-hour span) per week. The contract makes no mention of Frank's right to drain-offs from the closed cistern whenever there is extra water. Drain-off rights are all unwritten, based on trust between the two parties, built over decades since they first met back in the 1970s.

Long-established water access agreements, whether written or unwritten, are to some extent open-ended, in the sense of allowing a degree of flexibility, adaptation and improvisation. Overflows, mentioned above, when the season is unusually wet, are shared according to circumstances, based on secondary cisterns still in use. In a drought, plots that are still farmed are irrigated first. Water rights to plots that have been abandoned are tacitly appropriated by active farmers for the benefit of their own plots. The latter are conscious that by doing so they are breaking the unwritten agreement, and seem to be rather uncomfortable (and, at any rate, circumspect) about appropriating others' access rights.

Disputes arise when water rights and obligations are not respected. According to our main informant, when access to a spring was denied, the dispute was resolved by referring to the old oral agreement. For instance, the existence of a stone-built irrigation furrow between a spring on private land and a cistern on a neighbour's plot was used as evidence of the latter's right to water from the spring. Stone irrigation furrows channelling water from the springs, built over centuries, have been and still are used as evidence of rights and obligations under the sharing system, particularly informing which communal cistern fills

which secondary one. However, not everyone interpreted the arrangement as above. One of our informers (Ioanna Theodorou) argued that what was shared with others was only overflows, not the entire spring. Her diverging view is yet another demonstration of how fragile the old consensus might be in the face of changing conditions.

It is important to emphasise that farming in Poulati is a declining pursuit. In the 1980s, one could count more than 25 farmers tending their narrow plots. At the time of writing (September 2022), four of the six local farmers were over 75 years of age (Apostolos Georgoulis, Frantzeskos Georgoulis, Christos Georgoulis, Frantzeskos Kroustis). The other two, the brothers Kostas and Vaggelis Georgoulis, sons of Apostolos, are in their late forties. A newcomer, Dimitris, linked to one of the local families, is currently testing the commercial viability of caper cultivation. Others, though not active in farming, keep small vegetable plots as a hobby in the summer months.

Three issues seemed to worry those remaining in Poulati. For Frantzeskos and Christos, that their descendants have abandoned farming, without which the water infrastructure is difficult to maintain. For Zoi Gozadinou, an architect, that changes in land use often associated with tourist exploitation risked upsetting the landscape's fragile balance. For Ioanna and Kostas, that the recent (2015) cadastre has divided the plots, situating for instance the main old communal open-air cistern on private property, and separating it from the water spring feeding it. Even though they all adhered to the old water-sharing arrangements, they were suspicious that changes might undermine the understanding on which agreement rested.

We return to the future of farming in Poulati, and of the system of collectively managed water resources used to irrigate the area, in the closing section of this chapter. Before that, we turn to the question of how the Poulati system performs when assessed against Elinor Ostrom's 'design principles of long-surviving, self-organized resource regimes' (Ostrom 2000, 149–153).

13.4 DESIGN PRINCIPLES

Ten years after the publication of the *Governing the Commons* book that eventually won her the 2009 Nobel Prize in Economics, Elinor Ostrom – an untypical economist – was invited by the prestigious *Journal of Economic Perspectives*, one of the flagship publications of the American Economic Association, to write an article on 'Collective action and the evolution of social norms', where she identified 'the key factors that affect the likelihood of successful collective action', and explained 'how potential co-operators signal one another and design institutions that reinforce rather than destroy conditional cooperation' (Ostrom 2000, 138). In this section we explore how the Poulati system fits into Elinor Ostrom's scheme.

13.4.1 Setting the Boundaries

The presence of clear boundary rules is the first of Ostrom's eight 'design principles of long-surviving, self-organized resource regimes':

> If a group of users can determine its own membership – including those who agree to use the resource according to their agreed-upon rules and excluding those who do not agree to these rules – the group has made an important first step toward the development of greater trust and reciprocity. Group boundaries are frequently marked by well-understood criteria, like everyone who lives in a particular community or has joined a specific local cooperative. Membership may also be marked by symbolic boundaries and involve complex rituals and beliefs that help solidify individual beliefs about the trustworthiness of others. (Ostrom 2000, 149)

Poulati is a close-knit community, occasionally opening to admit new members. The largest part of the irrigated area, 13.5 out of 15.5 hectares, is owned by the descendants of the six local families listed earlier. The four non-local proprietors – two Greek, one Dutch and one British – were brought in by Thomas Gozadinos (1942–2022), a medical doctor serving at a public hospital close to Athens, sometimes indirectly. As revealed in an interview, this was how Chatzigiannakis, also a medical doctor, a colleague and close friend of Thomas, came to the area: Gozadinos vouched for him with another landowner (Georgoulis), who in turn approached Chatzigiannakis with an offer for a piece of land nobody else knew was for sale. It was the same with Helen, who arrived in Poulati in the early 1990s, invited by Vicos Nahmias, the close friend of Thomas. It was only in 2016 that she was offered a plot for sale by the farmers. She reminisced: 'I realized they would rather give it to me than to someone they didn't know. But I consider the repeated obstacles for the buying and evaluating building possibilities as evidence that outsiders would never be truly accepted.'

In other words, buying land in Poulati resembles becoming a member of a club, whose new members must be sponsored by older established ones. It is worth noting that, as mentioned earlier, the combined area owned by new entrants (2.0 out of 15.5 hectares) remains altogether small.

13.4.2 Rationing Scarce Resources

In Ostrom's scheme, access rules are at the heart of sustainable and equitable resource regimes:

> The second design principle is that the local rules-in-use restrict the amount, timing, and technology of harvesting the resource; allocate benefits proportional to required inputs; and are crafted to take local conditions into account. If a group of users is going to harvest from a resource over the long run, they must devise rules related to

> how much, when, and how different products are to be harvested, and they need to assess the costs on users of operating a system. Well-tailored rules help to account for the perseverance of the resource itself. (Ostrom 2000, 149–150)

As mentioned earlier, water access in Poulati is based on written as well as unwritten arrangements. Clauses detailing access rules were found in the land sale contracts that we inspected. One contract explained that the plot of land purchased came with the right to use water four times a week (specifically: Tuesday, Wednesday, Saturday and Sunday) from a certain spring located outside its boundaries. Another stipulated that the buyer had the right to draw water from the seller's spring once a week. A third contract specified the spring from which the plot of land purchased could draw water, also once a week; and so on. Interestingly, the language used in contracts implies that it is the land that is invested with rights, not the persons who own it. This resonates with Ostrom's observation in her discussion of the Valencian *huerta* (well-demarked irrigation area): 'In Valencia, the right to water inheres in the land itself' (Ostrom 1990, 71).

13.4.3 Setting (and Changing) Rules

The third design principle is that 'most of the individuals affected by a resource regime can participate in making and modifying their rules' (Ostrom 2000, 150). This is key to compliance: individuals are more willing to abide by the rules if they participated in their design (Bowles 1998).

How rules were originally set is lost in the mists of time. In a book published in the 1930s, its author, a local priest, ancestor of one of the current proprietors, described how the Orthodox monastery of the Virgin Mary of Poulati was built between 1865 and 1872. Water for the construction of the monastery was donated by plot owners. The author quoted a local builder explaining to him that 'Each proprietor had his day and his hours' for the use of water from a particular cistern; 'We planned how we should arrange it so that no one is wronged' (Vernikos 1933, 30). The author went on to narrate how 'The virgin Mary licked her finger and erased all our accounts written on stone tiles', meaning that local proprietors agreed to receive no payment for donating water used in building the church.

13.4.4 Monitoring Compliance

The fourth design principle is that 'most long-surviving resource regimes select their own monitors, who are accountable to the users or are users themselves and who keep an eye on resource conditions as well as on user behavior' (Ostrom 2000, 151).

From our interviews with two landowners who still farm the land in the traditional way (Christos Georgoulis, Frantzeskos Kroustis), it emerged that they acknowledge a third figure (Apostolos Georgoulis, Christos's older brother) as informal 'monitor', on the grounds that he is the holder of the historic memory of ancient rules. His son, Kostas Georgoulis, spoke affectionately of his father's 'imposing personality' that 'leaves little doubt on how water should be rightfully shared'.

As explained earlier, the distinction between communal and secondary open-air cisterns corresponds to a different status between those who distribute water from their own communal cistern to others, and those who receive it below in their collecting cisterns. Kostas Georgoulis, owner of the largest active communal cistern, explained that 'ownership of this large central cistern is separate from the land on which it is situated. I bought it to control the water and protect my neighbours' water-rights'. He is proud that he went out of his way in terms of time and expenses to preserve the built infrastructure. Trust between farmers has been built over a long period of cooperation (they often work together or share tasks), and is bolstered by family ties (they are often brothers, cousins or brothers-in-law).

13.4.5 Enforcing Sanctions

Ostrom's fifth design principle is the use of 'graduated sanctions that depend on the seriousness and context of the offense. By creating official positions for local monitors, a resource regime does not have to rely only on willing punishers to impose personal costs on those who break a rule' (Ostrom 2000, 151).

Although no such official position exists in Poulati, uncertainty about rules is resolved by recourse to the elderly unofficial 'monitor' (Apostolos Georgoulis). Our informants seemed genuinely surprised by our interest in how infringements are dealt with. ('Why should anyone cheat? It wouldn't do him any good.')

Once again, trust in a close-knit community is of crucial importance:

> In contrast to the uncertainty caused by these environments, the populations in these locations have remained stable over long periods of time. Individuals have shared a past and expect to share a future. It is important for individuals to maintain their reputations as reliable members of the community. These individuals live side by side and farm the same plots year after year. They expect their children and their grandchildren to inherit their land. In other words, their discount rates are low. If costly investments in provision are made at one point in time, the proprietors – or their families – are likely to reap the benefits. Extensive norms have evolved in all of these settings that narrowly define 'proper' behaviour. Many of these norms make it feasible for individuals to live in close interdependence on many fronts without excessive conflict. Further, a reputation for keeping promises, honest dealings, and

> reliability in one arena is a valuable asset. Prudent, long-term self-interest reinforces the acceptance of the norms of proper behavior. (Ostrom 1990, 88–89)

As mentioned earlier, past disputes were settled by reference to old oral agreements, supported by evidence of water rights as embedded in stone-built irrigation furrows from one plot to another. In other respects, compliance is voluntary. More recently, water rights to abandoned plots have been tacitly appropriated by active farmers to irrigate their own plots. This may be seen as a flexible adaptation of existing rules, although the slightly embarrassed attitude of the persons concerned suggests that perhaps they themselves may at least partly see it as an infringement.

Ostrom's theory of 'long-surviving, self-organized resource regimes' largely rests on the five design principles hitherto discussed. This is how she summarises their connection to each other, and their contribution to her general scheme:

> When the users of a resource design their own rules (Design Principle 3) that are enforced by local users or accountable to them (Design Principle 4) using graduated sanctions (Design Principle 5) that define who has rights to withdraw from the resource (Design Principle 1) and that effectively assign costs proportionate to benefits (Design Principle 2), collective action and monitoring problems are solved in a reinforcing manner. (Ostrom 2000, 151)

In Ostrom's scheme, the next three design principles play a supporting role to the first five.

13.4.6 Resolving Conflict

'The operation of these principles is then bolstered by the sixth design principle', which concerns 'the importance of access to rapid, low-cost, local arenas to resolve conflict among users or between users and officials' (Ostrom 2000, 152).

A classic example of that would be the Tribunal de las Aguas, 'a water court that has for centuries met on Thursday mornings outside the Apostles' Door of the Cathedral of Valencia' to adjudicate on disputes between irrigators from the canals, assess damages, and establish fines in cases concerning access to the waters of the Turia River in the *huerta* near the city of Valencia (Ostrom 1990, 71–74).

No such institutions have emerged in Poulati, partly because its size is significantly smaller: Poulati is 1000 times smaller than the Valencian *huerta* (15.5 hectares compared to 16 000 hectares, respectively). Besides, most interviewees agreed that going to court over water right violations is unthinkable. It has never happened. Christos Georgoulis, who tends Frantzeskos Kroustis's

land, said laughingly: 'I would just shout loudly to whoever takes our water, and may not serve him wine at the feast, but that would last a couple of days and then I'd forget about it.' This example of informal conflict resolution shows that the existence of social bonds and exchange relationships within the community make formal procedures unnecessary.

13.4.7 Achieving Official Recognition

The seventh design principle is the 'minimal recognition of the right to organize by a national or local government', which affects the 'capability of local users to develop an ever-more effective regime over time' (Ostrom 2000, 152).

In the case of Poulati, historical research suggests that the local community may have been granted such recognition by the authorities during the period of Venetian domination (1207–1617):

> For the resolution of conflict between Greeks, it seems likely that … the dynast applied his 'good judgement' and the Law that had evolved locally before the conquest of the islands, which obviously contained elements of Byzantine Law. In the early 14th-century a Code of laws was established, similar to the one applied in Cyprus, but adapted to the customs of the Cycladic islands, called by local people 'Customs'. Although a formal system of laws did exist, Greeks preferred to resolve their differences by appealing to the arbitration system based on the customary law which evolved before the Venetian conquest. (Symeonidis 1990, 136)

It is possible, therefore, that water rights in Poulati may have also been codified by the Venetian authorities in the 14th-century *Codex*. In modern times, local users have relied on a system of arrangements, written and unwritten, underpinned by contracts and memory respectively, without further official recognition.

13.4.8 Multi-Layer Governance

In some cases, 'long-surviving, self-organized resource regimes' feature a more complex governance structure:

> When common pool resources are somewhat larger, an eighth design principle tends to characterize successful systems – the presence of governance activities organized in multiple layers of nested enterprises. The rules appropriate for allocating water among major branches of an irrigation system, for example, may not be appropriate for allocating water among farmers along a single distributory channel. Consequently, among long-enduring self-governed regimes, smaller-scale organizations tend to be nested in ever-larger organizations. It is not unusual to find a large, farmer-governed irrigation system, for example, with five layers of organization each with its own distinct set of rules. (Ostrom 2000, 152–153)

As pointed out earlier, Poulati is much too small for such multi-layer governance structures to emerge. It is certainly possible to envisage the area as being nested in a larger valley, where different rules may well apply. This broader question, however, lies beyond the scope of our research.

13.5 CONCLUSIONS

In the preceding pages we explored a locally devised system of equitable and sustainable access to scarce water resources in Poulati, an area on the Cycladic island of Sifnos, Greece, drawing on interviews with landowners, notary records and local histories. We showed that the set of rules for rationing water was already present in the early 14th-century, when the island was under Venetian domination. We finally traced the resilience of the Poulati system to its close fit with Elinor Ostrom's 'design principles of long-surviving, self-organized resource regimes'.

There is therefore little doubt that the Poulati system has a great past. The question is: does it have much of a future? We have already discussed how farming in the area is a declining pursuit, the number of active farmers dwindling, most of them well past retirement age, their children unwilling to follow on their footsteps.

The threats to the survival of Poulati, the quintessential fragile territory, although superficially diverse (ranging from unauthorised construction in the area to drilling for water from the same aquifer as the springs), can in fact be traced to the poorly regulated growth of tourism. Tourism has certainly brought prosperity to Sifnos, as to most other Greek islands, freeing its people from the hardship and toil facing older generations. According to recent estimates (Bürgisser and Di Carlo 2022), tourism accounted directly and indirectly for over 20 per cent of Greece's gross domestic product, and over 25 per cent of all employment in the country. At the same time, tourism acts as a 'resource curse' (Auty 1993), sucking up resources from competing uses. Why keep up subsistence farming in Poulati when more money can be more easily made selling goods or services to tourists?

The very essence of the 'resource curse' is that exploitation of the abundant resource (in this case) often works to the detriment of the long-term viability of the resource itself. Rampant tourist growth threatens not just the ancient set of rules for rationing water in Poulati, but all that made Sifnos (and the other Greek islands) attractive to visitors in the first place.

Conversely, a possible way forward for Poulati is to reconcile it with tourism, and in the process redefine tourism itself, making it compatible with respect for natural resources. Indeed, it is not hard to imagine a more sustainable tourism model, with fewer visitors staying in accommodation with a smaller environmental footprint. In such an alternative model, Poulati's

ancient system of equitable and sustainable access to water would be promoted as part of the island's heritage and unique contemporary appeal, adding value to tourism activities, with guided tours to the area for a restricted number of visitors, and with the 'kilometre zero' (Km0) organic tomatoes and other produce grown there brought to their table.

Our research, drawing on fieldwork conducted in the context of STARTS4Water, a collaborative European project, is part of an innovative effort to give the Poulati system a new lease of life, by mobilising artists, engaging the local community, raising awareness, and exploring alternative development paths that will secure its place in the island's future.

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