
PRELIMINARY REMARKS

In a context marked by multiple crises (e.g. Brexit, the refugee crisis, terrorist attacks, environmental stressors, the COVID-19 pandemic, the rise of nationalism in the Member States and of Euroscepticism), the European Union found itself in a challenging situation that uncovered serious limitations in its system of governance. Managing and overcoming them require building better institutions and adopting better public policies, that could further increase preparedness, adaptability and transformation, *i.e.* the resilience capacity in different economic, social and environmental areas.

Resilience offers us an almost unique perspective, a dynamic vision on the whole thanks to which we can understand mechanisms, functionalities, drifts and recoveries in an increasingly unstable world that is unpredictable both in terms of evolution as well as in terms of structure. Consequently, resilience-based approaches have seen an exponential growth, not only in the scientific literature, but also in European public discourse. Resilience is mentioned in strategies, programmes, action plans and even in legislation, thus appearing as a panacea to most of the EU's challenges. If in 1990, according to the database of the Official Journal of the European Union, only 6 documents included the word "resilience", its use increased to 186 documents in 2010, and to 1127 in 2020 (Official Journal of the European Union, 1990–2021).

The crisis generated by the COVID-19 pandemic has further strengthened the importance of resilience-based policies in the European Union, as reflected in the NextGenerationEU Action Plan and in the National Recovery and Resilience Plans, which are viewed as key instruments of European governance. Moreover, looking at the ambitions expressed in these plans, it can be understood that resilience is not perceived just as the key to the recovery of European economies after the crisis, but also as a transformative process leading to a "greener, more digital, more resilient", more equal, safer and healthier development (European Commission, 2020) – a vision that resonates with the evolutionary perspective of resilience (Reggiani, De Graaff and Nijkamp, 2002; Martin and Sunley, 2015). We are talking about resilience performance, but also about resilience capacity within a model of sustainable development with strengthened social and environmental dimensions.

The resilience thinking

According to OECD (2014), resilience thinking is about anticipating and reacting to risks, shocks and stressors, as negative events, such as: covariate shocks (infrequent events with an impact on almost everyone in the target group, such as violent conflicts, volcanic eruptions or currency devaluations), idiosyncratic shocks (significant events that specifically affect individuals and families, such as the death of the main breadwinner or the loss of income-generating activity), seasonal shocks (such as annual flooding linked to the rainy season, food market price changes) or

recurring shocks (such as frequent displacement or endemic cholera in particular communities), and stressors (long-term trends such as: climate change, governance and insecurity, economic marginalization and volatility, environmental degradation, demographic changes, which can change the nature and impact of future shocks).

In general, resilience is considered to be a positive characteristic of a system or entity. It designates the ability to resist shocks (exogenous or endogenous), to absorb them, to bounce back from them (recover and adapt) or to move forward (innovate and transform), in order to preserve or maintain its own functions and core performances, but also to play a key role in the process of long-term economic development. The key characteristics of a resilient system are flexibility, recovery, adaptation and innovation (IDEA, 2017). Thus, thinking of a system in terms of resilience implies proper understanding of issues such as: the capacity to resist (a shock does not alter the equilibrium of the given system), the capacity to absorb (a shock alters the initial equilibrium, but the system can adapt, recovering the initial equilibrium or finding a new one, by maintaining its model and functions), the capacity to adapt (a shock alters the initial equilibrium, but the system recovers by adapting, although without any major change in functions and characteristics) and the capacity for transformation (the capacity of the system to generate new structures, new functions and new models, etc.).

In other words, an entity's resilience refers to its capacity to cope with change and continue to develop through innovation, as a reaction to shocks and stressors. According to Martin and Sunley (2015), the conceptualization of regional resilience should comprise four aspects/steps: the risk of a region's key economic actors to shocks, their resistance to the effects of economic shocks, their ability to adjust or resume their main activities, and the degree of recoverability from the shock. All these conditions are dependent on the nature, duration and intensity (scale) of the shock, which means that economic resilience should be interpreted as a dynamic process of robustness and adaptability, where the interdependence of spatial and temporal elements influence the way local economies react to adverse events. Resilience thinking could give insights on some of the specific characteristics and weaknesses of socio-economic systems, such as: the way in which shocks can divert development directions from the established objectives (the risks), or the way in which the potential for the system's capacity to react, adapt and transform can be optimized.

In this context, one may notice that resilience, as a theoretical concept, started to be increasingly used to formulate aims of various public policies (local, national or supra-national), sometimes replacing the notion of sustainability as an ultimate goal of long-term development. Also, it is important to underline that "resilience is not only about being persistent or robust to disturbance. It is also about the opportunities that disturbance opens up in terms of recombination of evolved structures and processes, renewal of the system and emergence of new trajectories. [...] It does not imply that resilience is always a good thing." (Folke, 2006, p. 259).

Resilience thinking is also relevant for the EU's regional policies and regional development, considering the potential impact of resilience gaps on the core-periphery structural differentiations, and on the intra-EU economic, social and territorial cohesion. Thus, an imperative need emerges to better understand the EU economy's performance and capacity in terms of resilience and to reconsider the current regional growth and convergence theories and models, in order to provide new decision-making tools and methods. More effective planning instruments are needed to attain some of the main objectives set by the EU treaties, such as to sustain "balanced territorial development", enhance "economic and social cohesion", and promote territorial "convergence of

economic performances". In this context, the spatial dimension of resilience analysis interacts with the economic, social, institutional and environmental dimensions in a multidisciplinary, multilevel, and multiactor approach, highlighting the impact of connectivity and accessibility (transport and communication infrastructures, networks) on resilience capacity or performance, strengths and vulnerabilities, and the costs and benefits arising from the geographical positioning.

The spatial dimension of resilience and *The European Atlas of Resilience*

Spatial resilience is "at the forefront of attempts to operationalize and quantify resilience concepts" (Allen et al., 2016) and an essential component of resilience theory. Looking at resilience from a spatial perspective means acknowledging the differentiated and discriminatory competence of territories to bounce back to desired functions when hit by unexpected shocks (Brunetta and Caldarice, 2019). Understanding these differences and the general patterns of resilience in a territorial context is essential when designing strategies at different spatial levels.

One of the best ways to communicate results concerning territorial resilience is by mapping resilience performance and resilience capacity, and then carefully arranging cartographic materials to form a structured atlas. Atlases are systematic collections of maps characterized by a uniform formal structure and design, which share "the overall goal to communicate spatial knowledge and facilitate new insight into geographic phenomena" (Siemer, 2020). Either classical printed or modern online interactive, atlases constitute powerful ways to communicate science. If carefully designed to respond to policy concerns, they also serve as a scientific tool for better understanding the spatial dimension of resilience and as useful decision support instruments.

The scientific enterprise called the *The European Atlas of Resilience* is perhaps the most daring of its kind. However, it is also a product of many compromises to overcome data availability and methodological challenges, while adopting a multidimensional approach in a multidisciplinary setting. The atlas cannot claim to be the end of the road, nor to give infallible verdicts. Instead, it is only an attempt to inquire factual heterogeneity through a conceptual framework that is both standardized and relevant. This atlas maps situations of great complexity in the European Union, precisely so that we can better visualize them, be aware of them, understand them and reflect on them. Such an approach is indispensable, because resilience, although it seems to be a fashionable concept used by scientists, is also a concept that requires deep knowledge of the territory, an integrated vision and, last but not least, the ability to make connections. This type of knowledge can lead to more effective resilience-based and place-sensitive policies. In constructing the atlas, the geographical perspective has certainly played a key role, but it is the interdisciplinary approach that finally paved the way to an integrated and multidimensional understanding of national and regional resilience.

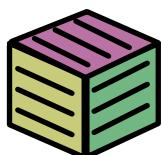
Context and added value

The European Atlas of Resilience was elaborated as one of the main results of ReGrowEU – "Advancing ground-breaking research in regional growth and development theories, through a resilience approach: towards a convergent, balanced and sustainable European Union", a research project developed in the framework of Programme 4: Fundamental and frontier research of the National

Plan for Research-Development and Innovation for the period 2015–2020 (PNCDI III). The project was funded by the Romanian Government, through the “Complex Border Research Projects” (PCCF) instrument, as a result of the 2017/2018 competition, its central theme was resilience in relation to the specific issue of regional growth and convergence in the European Union (EU), from the perspective of core-periphery determinants.

The project was implemented through the contribution of multidisciplinary teams from three universities in Romania, coordinated by Professor Peter Nijkamp, a world-renowned figure in the field of regional studies. The consortium included: (1) “Alexandru Ioan Cuza” University of Iasi as the lead partner, through the Centre for European Studies within the Faculty of Law (team coordinated by Professor Gabriela Carmen Pascariu), (2) Bucharest Academy of Economics Studies as partner, through the Research Center for Macroeconomic and Regional Forecasting (team coordinated by Professor Daniela Luminita Constantin), and (3) Babes-Bolyai University of Cluj-Napoca as partner, through the Center for the Study of Good Governance within the Public Administration and Management Department of the Faculty of Political, Administrative and Communication Sciences (team coordinated by Associate Professor Bogdana Neamtu).

Like any atlas, *The European Atlas of Resilience* has been designed to be both informative and a decision-making instrument. The methodological approach has been designed in a flexible manner, to allow the construction of a first multidimensional, multishock and multilevel mapping of national and regional resilience for the EU28.



Multidimensional

The overall multidimensional assessment of resilience includes five different areas: society, economy, environment, institutions and democracy.



Multilevel

The exploratory analysis of resilience has been conducted at three territorial levels: the EU level, the national level, and the regional level (NUTS2).



Multishock

Primarily, the current atlas maps territorial resilience to the 2008-09 economic crisis. However, it also explores resilience to other shocks (e.g. the heatwave from 2003, and the COVID-19 pandemic), by analyzing them in four additional case studies.

One major asset of the current atlas consists in addressing both resilience capacity and resilience performance, as well as exploring their interdependence. Hence, beyond assessing and mapping resilience capacity and performance, the statistical analysis carried out shows that measures of regional and national resilience capacity, as developed within the framework of the ReGrowEU research project, have significant explanatory power.

Although it has some limitations, the current atlas could be considered a first attempt to offer an image that is as comprehensive as possible of regional and national resilience across the EU28. It thus complements a long list of previous European-wide territorial atlases, carefully

prepared under the umbrella of various institutions and programmes, such as the European Commission and the ESPON programmes.

The atlas is structured in three parts. Following the Introduction, the first two parts refer to resilience performance (Part I) and resilience capacity (Part II), while the last part delivers four thematic case studies (Part III).

In the hope that the atlas will not be a shock in the negative sense, but only a preliminary answer to an increasing need for new perspectives in resilience thinking and policy making, we leave it to the reader, who may be more or less informed, to provide feedback. This is because the multidisciplinary team that produced the atlas also needs feedback. And the fact that this enterprise has been undertaken at the “Alexandru Ioan Cuza” University of Iasi, situated near the eastern border of the European Union, but in collaboration with the Bucharest Academy of Economics Studies and the Babes-Bolyai University of Cluj-Napoca, in the form of a fortunate and inspired territorial distribution, can have many meanings both in terms of vulnerabilities as well as opportunities.

The editors