



Innovation for Resilience

Editors
Teresa de Noronha
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CHAPTER 1

Resilience for Innovation – A Research Agenda

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Teresa de Noronha

Introduction

Last decade is characterized by different types of crises and shocks in the socioeconomic systems, creating a turbulent context and calling for a better understanding of what the dynamic perspective of change is. For countries, regions and cities a better understanding of governance urges and calls for action.

Resilience is gaining attention in social sciences, in general, and in regional studies, in particular. The concept has been particularly useful to rethink regional development models in the European Union when integrating the contribution of innovative dynamics in regional strategies and also in considering prevention and planning environmental, socio-economic and technological risks.

Resilience is commonly characterized by having an engineering perspective, if focusing the return to a steady-state equilibrium, and an ecological perspective, if paying more attention to the carrying capacity of the system as it absorbs shocks without losing its properties (Simmie & Martin, 2010). Today's use of the "resilience" metaphor in social sciences requires careful considerations to avoid frequent fuzzy meanings (Davoudi et al., 2012). The Evolutionary Economic Geography School suggests connecting the concept to ideas that allow reflecting how different socio-economic systems at different scales are able of withstanding, recovering, re-orientating and renewing themselves when confronted with external disruptions or internal systemic failures. In this way resilience is being debated integrating an evolutionary approach (Boschma, 2015) and demonstrating how complex systems adapt and evolve. The vision of complex adaptive systems is very rich as it facilitates to clarify the emergent characteristics at multi-level interactions (Cooke, 2012), uncovering, for example, the mechanisms that enable top-down and bottom-up change linking territories at different levels, with systems and networks, with specific organisations, their behaviours, routines and incentives. It is clear that resilience, and regional resilience in particular, require effective innovation systems (Simmie, 2014) as innovation is a central aspect of the adaptation and adaptability of territories. The micro-determinants of resilience are crucial, connected with the dynamic capabilities of organizations (Teece, 1999).

For resilience consideration, the Public Sector plays a crucial role. The State has a crucial role in the coordination and governance of market exchange and it is central to create the institutional architectures that create advantages in some cases (Hall & Thelen, 2009). The State

is an inducer of innovation and new activities, both by supporting and enforcing new legislation but also by public procurement, acquiring products that stimulate other economic agents (Uyarra et al. 2013).

Organization of the book

This book is a contribution to the debate of resilience applied to the Portuguese case. Organized in eight chapters, several contributions from the Portuguese reality are gathered on topics such as the definition of policies for resilient territories, supply networks of public services, innovation in enterprises. Knowledge management in the tourist industry, resilience in rural areas, urban regeneration strategies, and technological learning as an organizational resilience mechanism are explored as well.

After the introductory chapter, in chapter 2 Luís Grave underlines that the development of complex urban systems is subject to various factors influenced by the objectives of the established territorial policies or urban development agents. There are potential risks and impacts of land use in result of external factors adverse to set goals and desired dynamics. It is necessary to prevent and overcome these harmful effects through adaptive management of land use management able to anticipate and consider preventively, possible future scenarios contraries to set development strategies and set safer development goals or adopting strategic adjustment measures in order to avoid harmful dynamic of the constant balancing of the urban system. How to configure this management is the challenge. As a starting point and basis for this approach, the author found an area on the south bank of the Tagus estuary suffering from a context of stagnation after an abrupt stop of the rapid urban growth that was occurring, induced by construction of the 'Vasco da Gama Bridge'. From the impacts on land use this chapter went to seek the necessary responses in terms of mechanisms and procedures that should be included in land management so that it can avoid such adverse effects. In the end, it identifies the potential benefits that could result, if applied in the same context, through the proposed adaptive land use management system model.

Chapter 3 by Ricardo Tomé, José Afonso Teixeira and Margarida Pereira debates the relevance of public services which due to their universal and inclusive character mitigate social inequalities, foster economic growth and bring populations and territories closer, also making them more resilient and cohesive. In Portugal, after restoring a democratic regime (1974), joining the EEC/EU (1986) and, at a different level, information and communication technological innovation, have contributed to the expansion and modernisation of public services. The extension of compulsory schooling and the opening of access to higher education, the creation of the National Health Service and the democratisation of justice have required expanding the respective networks of facilities, technological innovation and suitable training. Public administrative services have been restructured, formats diversified, technology incorporated and networks integrated. Neoliberalism and the economic and financial crisis (2008) weakened the Welfare State through the sub-contracting of services, rationalisation of resources, defence of contracting models and privatisation. This chapter reflects on the role of public services in territorial resilience and cohesion, showing the changes in the public services for education, health, justice and

administration in Portugal and some reorganization consequences of the crisis. Based on three case studies, it also analyses patterns of the use of services in different geographical contexts (densely urbanised, rural and transition territories).

In chapter 4 Sílvia Fernandes, Marisa Cesário, Bruno Jesus and José Monteiro Barata identify the sectors of the Portuguese economy that most participate in cooperation to innovate and which sources/agents are most used in the process, observed by sector and type of innovation. Using the data from the Community Innovation Survey (CIS-2012), it first appraises the nature of the innovation process in terms of cooperation or firm-based innovation, and then differentiates the results by sector illustrating which cooperation sources/agents are most used (scope) and relative intensity (scale). The results suggest that main innovating sectors in the Portuguese economy are research-based, knowledge-based, and service-based. The external sources/agents most commonly used by the first are universities, suppliers by the second and firms' group by the third. Private customers are important sources in general, what means that Portuguese firms use customers' information and market relations for innovation purposes. These results are in line with the fact that Portuguese firms are mainly small and medium-sized (SME) and increasingly focused on services and knowledge.

Carolina Alves, Adélia Nunes and Joana Silva describe the case of Serra da Estrela in chapter 5. As a mountainous area, characterized by low density of population with an eccentric position, remote and associated to physical and natural constraints, the construction of more resilient territories can become a path towards the stimulation of development. The main issue of this work is to understand in what way the fixing of specific business constitutes a structuring element of social and ecological resilience. Through the valorization of human resources and improvement of potentialities of this territory such as local products, environment and landscape, the widening and diversification of the offer arises. However, bottlenecks are still to be considered such as the non-convergence with other local business hinders the creation of a more cohesive, competitive and resilient territory.

Chapter 6, by Bernadete Dias Sequeira, João Filipe Marques and António Serrano, presents some of the main results of a research about knowledge management in the hospitality organisations in the Algarve region. Its main goal is to understand, from a sociological perspective, how hotels create or acquire, retain, share and use their organizational knowledge. A comprehensive model of analysis providing an integrated overview of knowledge management was specially developed for this goal. The model is organized around two analytical axes: the first identifies the main steps of the knowledge management process (creation/acquisition, storage, transfer and use) and the second lists and describes the management practices that facilitate this process. Given that innovation is a very important outcome of knowledge management as a whole, this chapter focus on the last dimension, the use of organizational knowledge. The empirical research consists in three case studies of hotel groups operating in the Algarve, using semi-structured interviews to the hotel's managing staff and a survey administered to a stratified sample of employees.

In chapter 7, Célia Marisa Fonseca Ferreira, Teresa Sá Marques and Paula Guerra underline that the structure and organization of economy of cities results from both individual actions of many economic agents (individuals, families, business, government institutions, diversified organizations) and from the network of relationships established between them. The authors

used 24 interviews to retail sector business promoters and economic-oriented initiatives developers, carried out during 2015, to understand the motivations, expectations and difficulties involved in opening of business or conducting initiatives, the location factors, the partnerships and institutional support, as well as aspects related to innovation in the city centre of Oporto. This analysis contributes to the studies of bottom-up initiatives in the context of economic development, and thus support the delineation of private sector strategies as well as help to support delineation of public policies.

In the final chapter 8, Teresa Noronha and Victoria Del Pino emphasize the need for going back to the classical methods of considering the savings that repetitive processes introduce in the learning process of firms. Cumulative experience leads to performance improvement and may fill part of the existing knowledge gap based upon the Experience Curve (EC). The Microalgae Production Systems (MPS) was used for this research considering that it is one of the most exciting future-oriented business areas of modern biotechnologies, which have turned into an important global industry, with a diversified field of applications. Thus, the particularities of learning and experience accumulation processes have been used to conclude about the behaviour variations of the EC, by exploring and detecting some applications and misapplications of the concept. The research methodology is based on the case-study of Necton S.A., a pioneer Portuguese firm, dedicated, since 1997, to microalgae cultivation. Prior to this chapter, an in deep research of these authors attempted to understand the technical complexity of microalgae biotechnology. The conclusions emphasized in this chapter confirm that: i) the different MPS follow an experience curve, with progress ratios which are in between the ones determined for manufacturing firms and energy technologies; ii) the learning mechanisms play a similar role through the technologies life-cycle, although the MPS studied are different in technological complexity; and, finally and most important, iii) learning-by-doing is more relevant in early technology stages, learning-by-using appears to be fundamental in the maturity stage, and learning-by-searching is critical to solve particular technical constraints. This perception is very useful in the design of target strategies for innovation under constrains such as financial disruptive or economically lagging environments.

A research agenda

It is expected that different types of shocks, socio-economic, demographic, technological, environmental, financial, will accelerate, uncovering the deficits and structural problems of contemporary society. Resilience can become a critical area of research related to risk management and facilitating the deep comprehension and intervention in a changing environment. The results presented in this book confirm the fast-growing literature in the topic, highlighting three relevant fields for the Resilience research agenda:

- Resilience and innovation - studying how innovation increases at a multi-level perspective the resilience of different systems. This will necessarily include the studies of different national configurations that are more friendly and supportive of innovation (Amable & Lung, 2008), different systems and network configurations that create eco-systems

that are entrepreneurial and enhancers of knowledge production and exchange (Balland, Suire, & Vicente, 2013), the policies for stimulating a smart specialisation (Foray, David, & Hall, 2011) and the capabilities of firms and other key innovation actors (OECD, 2009).

- Resilience and risk – shocks and internal disruptions need to be addressed. The studies of risk management, especially relevant in urban and territorial physical planning, will include necessarily new dimensions of socio-economic and technological resilience (Alexander, 2013; Allan & Bryant, 2012; Dawley, Pike, & Tomaney, 2010).
- Resilience and territorial renewal – territories are living organisms that develop and grow but may also degenerate and die. Policy-makers and research will pay particular attention to the mechanisms that can increase the life-cycle of specific clusters (Ebbekink & Lagendijk, 2013), that can increase the competitiveness and cohesion of economic base (Bristow, 2010), increase proximity and related variety (Frenken, Van Oort, & Verburg, 2007), and stimulate the factors of uniqueness and that guarantee a long-standing place in the global economy.

The book hopes to contribute to the consolidation of the concept of resilience, both in scientific research and territorial planning. Useful to researchers and students, it supplies a diversified and balanced selection of cases related to management and promotion of territorial development in difficult conditions. Portuguese regional reality exposed and discussed in deep, thus, became a promising field of study *per se*.

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CHAPTER 2

The Adaptive Territorial Management - Design a Management System towards a Resilient Urban Development

Luís S. Grave

Introduction

The Issue

The urban system is a permanent complex construction, with the aim of conditioning society, its culture and activities more susceptible to various influences and constraints. Induced dynamics occur within its development, determined both by prior planning, and by unforeseen and adverse externalities to thought out plans, leading to instabilities or even processes with a negative tendency. This was the case with the recent economic and financial crisis which resulted in a context of stagnation or even recession for urban development in the consolidated city and the urban space in expansion or consolidation. The findings here are reflected in the following statement of amazement: could it be that nobody foresaw this, and why? It is my belief that it indeed matters that policy in general and spatial planning as governance of cities acquires the capacity to foresee, as far as possible, the distant consequences of its own decisions and the effects of externalities on urban development, that is, that for a sustainable and resilient urban development, this can be carried out using a permanently adapted strategy for a preventive and not merely positivist prospective.

However, the city, from the territorial point of view, consists of an urban system with a complex multifunctionality and structure. Therefore, in order to achieve the aforementioned governance of sustainable and resilient cities, this should be supported by a management system capable of efficiently managing that complexity. However, either due to the inefficiency of its practices or due to the ineffectiveness of its results, it can be seen that territorial management has shown itself unable to anticipate and monitor the mutability of urban systems (forms and functions) induced by actual transformation dynamics. The positivist planning that has lasted has failed, since it is based on policies and instruments managed segmentally and sectorally, where the definition of strategies does not correspond to a prior systematic assessment, as well as the definition of strategies not corresponding to actions undertaken, showing, through the disconnected state of the environment and the functioning urban systems, that it is urgent to have a management system supported by planning based on a prior systematic assessment of the contexts which are the object of management action.