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Resilience Thinking in Urban Planning

Springer

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Volume 106

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Preface and Acknowledgements

This book was born out of the frustrations of a group of urban planners and researchers who have increasingly felt the inadequacy of the planning systems and policies introduced to prepare cities for the future in an increasingly neoliberalising world. As this shortfall was becoming more evident among urban policymakers, planners and researchers in different parts of the world, a group of discontent researchers sought new approaches to cope with the increasing vulnerabilities of urban systems in the wake of growing socio-economic and ecological problems, privatisation of infrastructure services, fear and distrust in society and a loss of ecological services on the one hand; and decreases in welfare services and quality of urban environments, which have been shed by the appealing business and commercial centres, office spaces and the luxurious residential areas on the other. Our main intention in this book was first to identify how far existing planning systems and practices are able to support the sustained development of urban areas and prepare them to withstand both foreseen and unforeseen changes; while a secondary aim was to discuss the alternative perspectives, systems and principles of a new planning approach. Our combined enthusiasm brought us together in a research project supported by the URBAN-NET funding scheme under the Eranet Programme of the EU.

This book is a result of a research project entitled "Sustainable Land Use Policies for Resilient Cities," which took 2 years to complete, with additional work after the completion of the project reports. The project aimed to discuss and define sustainable land-use policies for the creation of resilient cities, which has become increasingly important in recent years since urban systems must accommodate different global influences in diverse forms and be ready to address potential uncertainties and unexpected changes. The research framework embraced the importance of "resilience thinking" in urban polices in the contexts of urban decline, socio-economic vulnerability, urban landscape degradation and institutional fragmentation.

The team was composed of four research groups from four countries, namely Portugal, Sweden, the Netherlands and Turkey, whose combined focus on the resilience concept was applied to urban planning and methods to assess resilience, especially by resorting to the definition of comparable attributes and indicators in different cities, being Istanbul, Oporto, Lisbon, Rotterdam and Stockholm.

The composition of the group of researchers, who were able to offer different perspectives and experiences from the four distinct countries of Europe, as well as a broad and in-depth knowledge of the case study cities, made the studies a real learning process for all the contributors to the project. From the very beginning this book was planned to be more than just a collection of papers, with the intention being to bring together chapters that followed a complementary approach. To achieve this, the research method to be followed by the individual researchers from different countries and cities was clearly defined, which made a comparison of the outcomes of the different studies easier. Meetings and field trips were organised in each of the case study cities, with special attention paid to the areas in which the research was to be focused. These meetings not only allowed us to understand each other's case better, but also brought us closer together as a team, working together towards a common goal. This book benefited a great deal from the respect and understanding created by this friendship. We, as the editors of the book, wish to emphasise the importance of this positive atmosphere on the quality of work. Thanks to this real team feeling, discussions were fruitful, attempts to understand and reflect the different perspectives were effective, and the completed work was detailed. We regret that we were not able to fully reflect the richness of the individual research outcomes within this book due to limitations of space, and would like to thank all of those that contributed to this book for their patience and cooperation when decreasing the several hundreds of pages to chapters of limited size, which was obviously tiring and tedious work.

We hope that the outcome will satisfy not only the contributors to the book, but also readers from different disciplines, origins and countries.

Were we successful in easing our initial frustration at the end of this research? Not exactly; however we believe that light has been thrown on possible alternative ways and means of overcoming existing and future problems, and we are confident in our belief that an alternative path exists that is based upon resilient thinking. We hope that this new perspective that we have attempted to elaborate will find reverberations in the fields of urban planning and urban research.

This book is devoted to young urban planners who will soon discover the potentials of resilience thinking for the future of our cities!

October 2012   Ayda Eraydin
                                                                      Tuna Taşan-Kok

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Chapter 1
Introduction: Resilience Thinking in Urban Planning

Ayda Eraydin and Tuna Taşan-Kok

1.1 Main Novelties and Contributions of the Book

This book has two main objectives. First, the intention is to discuss how well equipped contemporary planning theory and practice is in preparing urban areas to face the new conditions that have resulted from the neoliberal spatial agenda in an increasingly borderless world and its ability to address the escalating numbers of hazards, most of which are triggered by rising levels of consumption. Second, it aims to discuss the characteristics of a new theoretical approach to planning that may assist in the creation of resilient cities that are able to adapt to both slow changes and major pressures.

There is consensus in literature that urban areas have become increasingly vulnerable to the outcomes of economic restructuring under the neoliberal political economic ideologies of recent decades. The increased frequency and widening diversity of problems have made it evident that the socio-economic and spatial policies and practices introduced under the neoliberal agenda can no longer be sustained. Moreover, increasing ecological problems resulting from the overuse of resources and pollution as a result of uncontrolled market-oriented production and consumption patterns have made cities and regions more prone to such disasters as floods and droughts.

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In attempting to address some of the emerging problems, recent literature has identified changes in the nature of neoliberalism that have obviously not been systemic, being rather a set of changes leading to variety within neoliberalism (Peck et al. 2009). This new character of neoliberalism has been defined in different quarters as 'roll-out' neoliberalism (Peck and Tickell 2002), 'roiling neoliberalism' (Peck 2005) and 'deepening neoliberalism' (Brenner et al. 2010). Birch and Mykhnenko (2009) identify varieties of neoliberalism across Europe that are based on regional restructuring and economic growth trajectories, while Peck et al. (2009) point out the *contextual embeddedness* and *path dependency* of neoliberal restructuring projects that have played an important role in the divergent reactions of states to neoliberalisation. McGuirk (2005) specifies the different forms of neoliberalism and argues that it is not a unified coherent project but rather a series of complex and overlapping strategies that produce a hybrid form of governance in which state capacity endures rather than dissolves.

According to these debates, in the 1990s and 2000s, neoliberalism became a form of governance with an extended repertoire of neoliberal policy, which finds state intervention and public spending acceptable, although market-centred forces are dominant. The negative externalities of the economic system, however, are compensated for with the creation of certain institutions and additional mechanisms. As is to be expected, these changes affected the policies of cities and regions, leading to new forms of governance and the institutionalisation of governance and planning. Institutional changes are clearly observable in urban governance, especially in metropolitan regions (Brenner 2009; Matkin and Frederickson 2009; Feiock 2009), new legislation on urban governance (Allmendinger 2009; Fuller and Geddes 2008) and planning systems (Eraydin 2011; Taşan-Kok and Beaten 2011; Gunder 2010); however, they have not been supported by a new planning perspective.

Following a period of postmodern planning, neo-pragmatism, and collaborative and communicative planning appeared on the postpositivist landscape (Allmendinger and Tewdwr-Jones 2002). As discussed in detail in Chap. 2, there have been many criticisms of these theories emphasising the need for a new planning theory. Criticisms of existing planning theories have concentrated primarily on the lack of substance and end state (Taylor 1998) and, secondly, on power blindness (Hoch 1996). There are several debates claiming that instead of an 'end state' in the positivist approach and 'contentlessness' in neoliberal theories, the new paradigm should focus on alternate means of addressing the need for a more adaptive and reorganisational capacity in urban systems. In other words, there is near consensus on the need to change not only the focus, but also the way of thinking in planning.

In this book, it is argued that resilience thinking can form the basis of an alternative planning approach, calling for a reconsideration of the 'substance' of planning within a process that will focus on 'value systems and power relations' in decision making. In the theoretical chapters in Part I, the conceptual background of resilience and resilience planning is introduced, alongside a description of the links between spatial dynamics and resilience. Consequently, a new perspective for planning, referred to as 'resilience planning' throughout the book (see Chaps. 2–4), is introduced.

The need for a new perspective is made apparent with the evaluation of the spatial dynamics as well as policies and plans of metropolitan areas from different parts of Europe, namely, the Netherlands, Portugal, Sweden and Turkey. The studies in the first part of the book focus on the changing dynamics of different city regions in an increasingly globalising world and offer an evaluation of their level of preparedness to cope with uncertainties: in other words, their attempts to cope with contemporary conditions. In Chaps. 5–7, an evaluation of the existing policies, plans, projects and policy instruments, in which external dynamics are becoming increasingly prominent, is provided, together with an analysis of the endogenous dynamics that are triggered by external pressures. These three chapters present how existing planning systems have changed in recent years in the four countries and how far the new systems introduced have been able to empower the cities, not only in sustaining their existing functions but also in adapting successfully to expected or unexpected conditions.

In the final section of the book, case studies from five cities in the above-mentioned countries are introduced to show how resilience thinking can be used in an analysis of the plans and their outcomes. The book introduces a new and novel methodology (Chap. 8) for the studies in this book, and it is this methodology and its method of application that constitute one of the contributions of this book to the fields of urban studies and planning. The case studies (Chaps. 9–13) show clearly that although the planning systems are attempting to adapt to the changing conditions, what is actually being achieved is far from satisfactory in the creation of resilient cities.

1.2 Why is it the Right Time to Discuss 'Resilience' Within the Context of Planning Practice?

Increasing economic, social and spatial vulnerabilities in cities; the rapid depletion of natural resources, necessitating resource management; and the increasing frequency of ecological events and other causes of environmental degradation mean that the time is right to open discussions on the term resilience and to adopt resilience thinking in planning.

The above problems have highlighted a need for change in how the economy and society are regulated according to consumption-based market principles, namely, the current 'economic regime'. The 2009 economic crisis was clear evidence that one of the main sources of these problems was the neoliberalisation of the economic regime, which is an open-ended process with path-dependent strategies for adjustment and reconstruction in response to 'endogenous disruptions, dysfunctions and crisis tendencies' (Peck et al. 2009: 55). Cities have naturally been affected by the increasing numbers of upheavals, since their development has become increasingly dependent on the neoliberal debt-oriented economy and on individuals or organisations that share the responsibilities and risks of pursuing decentralised goals through individualism and entrepreneurialism. As the expanding role of governance engenders more participatory practices and a further democratisation of urban society, some public responsibilities are decentralised to semi-dependent public bodies, while others are

transferred to private organisations or public-private enterprises (Taşan-Kok 2011). The stakeholders of neoliberal urban and regional governance (policy makers, planners, mayors, decision makers, municipal commission members, NGOs, civil society organisations, neighbourhood committees, urban residents, etc.) all take part in planning, either directly or indirectly, and this complex system has accelerated the growth of entrepreneurialism, consumerism and property-led development in cities, limiting the opportunities for disadvantaged groups in urban society.

The last three decades witnessed rapid growth and urban expansion, accompanied by different opportunities and problems for diverse social groups. The neoliberal economic conditions accelerated poverty and exclusion, which resulted not only in social, but also spatial, vulnerabilities.

The structural adjustment programmes that began in the 1980s brought an end to Keynesian welfare state policies, to the detriment of the disadvantaged groups. Poor migrants living in inappropriately built housing in the peripheral areas and low-income groups who could only afford to live in high-risk locations, such as areas prone to landslides or earthquakes, faced several hazards (Pelling 2003; Riddell 1997), culminating in a vicious circle of poverty, vulnerability, disasters/hazards and economic loss. Within this vicious circle, besides the deregulation of the state and the diminishing role of the welfare state, the erosion of social capital and inappropriate planning and legislation that failed to provide equal opportunities for the disadvantaged groups also played important roles. The increasing privatisation and growing reliance on market forces in the cities have resulted in the development of particular land uses and spatial patterns. The 'changes in the physical forms of the urban landscapes as a result of increased perceptions of crime, terrorism, and external attack' (Coaffee 2009: 13) are all too visible. In certain cities, one can even observe fortified landscapes in the form of gated communities, indicating the increasing fear and vulnerability to social and economic change in urban societies. As discussed earlier, there has been growing criticism of the current planning systems and practices, despite the tremendous change they have undergone in recent decades. While neoliberalisation and market-friendly policies have been affecting the way cities develop and function since the late 1970s, the neoliberalisation of social, economic and political processes permeated into urban development, planning and governance discourses and pushed planning practices in a market-oriented direction. As urban planning became increasingly market-oriented and entrepreneurial, planning became less capable of decreasing the vulnerability of cities. Short- or medium-term planning gradually replaced long-range, end-state planning (Healey and Williams 1993; Taşan-Kok 2008), and the focus of planning practices shifted to projects (Albrechts 2004; Healey and Williams 1993; Motte 1994; Taşan-Kok 2008) and land-use regulations. All around the world, urban development has become increasingly fragmented and piecemeal in character, with opportunity-led planning practices taking root everywhere in reaction to the rapid and complex change (Taşan-Kok 2004; Webster 2002). Most importantly, it has become impossible to control the system only through the regulation of endogenous factors, which makes it impossible to apply a system for the planning of cities, even in countries with a strong planning tradition.

The way in which a planning system transforms may differ depending on the national planning culture (see Chap. 6). In recent years, however, one common tendency has been for governments to become more interventionist, with the objective being to solve the problems created within the market mechanism; to redefine the power relations and operations of the market; and to protect the neoliberal economic system by making improvements in the problem areas in which political support has been reduced. In this book, it is claimed that the 'reforms' related to planning systems are unable to increase the resilience of urban areas, since the neoliberal ideology is sustained and the changes taking place are unable to change the market-driven nature of planning (Eraydin 2011) and even increase the contradictions in planning (Harvey 2005; Taşan-Kok 2011).

1.3   Why did the Concept of Resilience Become Attractive?

In recent years, the resilience concept has become quite visible in planning literature, which may be due to the lack of new perspectives in planning. In only three decades since its introduction by Holling (1973), resilience has emerged as a conceptual framework to describe models of change in the structure and function of ecological systems (see Chap. 3). Although grounded in the ecological sciences, the resilience concept has found popularity among natural and social scientists in attempts to examine the links between social-ecological systems (Berkes and Folke 1998; Berkes et al. 2003; Armitage and Johnson 2006; Walker et al. 2006) and institutional and organisational arrangements (Gunderson and Holling 2002; Anderies et al. 2004).

One of the charms of this notion is its efficacy for understanding, managing and governing complex linked systems of people and nature (Folke et al. 2004). Today, resilience is not only confined to academic discourses, having become prevalent in urban policy documents across the globe, since in practical terms, an understanding of resilience enables analysts and decision makers to identify the likelihood of shifts or transitions among different system configurations (Peterson 2000).

That said, substantially different definitions of resilience exist, even in ecological science (Brand and Jax 2007). Some ecologists consider resilience to be a measure of how fast a system returns to a state of equilibrium after a disturbance; however, Holling (1973) defined it as a measure of how a system could be perturbed without shifting to a different regime. Walker et al. (2002) describe resilience as the potential of a system to remain in a particular configuration and maintain feedbacks, functions and an ability to reorganise following disturbance-driven change. It is the capacity of a system to experience shocks while retaining essentially the same function, structure, feedback and, therefore, identity (Walker et al. 2006). Brand and Jax (2007) add to this list systemic-heuristic definition, which introduced the term panarchy. After conducting an analysis of the concept of resilience in social and political sciences, Pendall et al. (2010) reported that the resilience concept indicates considerable fuzziness, and indeed, the numerous interpretations and definitions of urban resilience

do make it rather fuzzy; however, as Lagendijk (2003) notes, this may simply be a symptom of the immaturity of the concept that will decrease over time.

The definition of ecological resilience used in this book depends upon three central features of resilience (Berkes et al. 2003: 6): (1) the ability of a system to absorb or buffer disturbances and still maintain its core attributes, (2) the ability of the system to self-organise and (3) the capacity for learning and adaptation in the context of change.

In this book, it is argued that diverse benefits may be drawn from the resilience approach through a shift in policies – from those that aspire to *control* the change to those that increase the *adaptive capacity* of the system to cope with, adapt to or shape the change. This way of thinking is helpful in understanding and analysing contemporary urban systems, defining a new approach and priorities and setting new principles in urban planning. Moreover, instead of pragmatism, it makes a focus on *substance* possible, allowing growth in an adaptive capacity that is based on principles rather than a definite end state. These characteristics, it is argued, are very important in bringing substance back to the planning agenda. The contribution of resilience thinking on planning can be summarised under the headings below. Resilience thinking:

– *Facilitates the understanding of the co-evolution of socio-economic and ecological systems*

 Social and ecological systems are characterised by co-evolutionary, nonlinear interactions, and efforts to understand such processes have led to the emergence of resilience as a way in which linked social-ecological systems with different perspectives can be understood (see Folke and Gunderson 2006).

 The concept of resilience enables the introduction of a framework that illustrates the way in which certain variables interact to reinforce one another and build structure or organisation. It also highlights the adaptive cycles, which consists of two forms of change: the slow and incremental processes of growth and accumulation, and the rapid and sudden processes of destruction and reorganisation in response to disturbance. The distinction between slow and incremental processes and sudden processes shaped under a disturbance is important, since it allows the consideration of co-evolutionary changes at different levels, which is an area in which contemporary urban planning perspectives that are based on the communicative rationality are lacking. According to Armitage and Johnson (2006: 3), 'an important construct of resilience is the identification and preservation of those slow variables that enable linked social ecological systems to renew and reorganise along a desirable trajectory, from a human perspective, in the wake of a major disturbance'. Therefore, resilience allows one to analyse the dynamics of social and ecological systems and to define how those evolutionary cycles enable urban systems to reorganise themselves.

– *Helps to underline the adaptive capacity of social-ecological systems*

 In previous literature, emphasis has often been on being prepared and taking effective action after a disturbance occurs. However, urban land-use planning is traditionally more concerned with doing things to minimise the effects of the disturbance (e.g. avoiding 'bad neighbour' nuisances through the separation of certain land uses, implementing planning policies that minimise energy

consumption and CO_2 emissions) and reducing the risks and negative effects of a possible disturbance (e.g. locating developments away from ecologically sensitive areas or areas liable to flooding).

Adaptive capacity provides the opportunity for self-organisation, which is a process of attraction and repulsion in which the internal organisation of a system is not guided or managed by an external source (Heylighen 2002; Holling 1992). The self-organisation of ecological systems establishes the arena for evolutionary change; however, self-organisation is not always possible, and systems have had to undergo thorough change. Transformation, in such cases, is inevitable and is defined as the capacity to create a fundamentally new system when ecological, economic or social (including political) conditions make the existing system untenable (Walker et al. 2004). Planning may play a vital role within this process.

– *Highlights external and nonsystemic factors and disturbances that are important in shaping the individual urban systems*

The resilience of a system is determined from the interactions of certain external and nonsystemic factors and variables that operate at different scales, but which influence the overall dynamics of the system (Walker et al. 2006). The growth in interest in resilience is considered to be a response to a contemporary sense of complexity, uncertainty and insecurity and is part of the search for formulae to ensure adaptation and survival (Christopherson et al. 2010). In this way, it is possible to describe to what extent the urban system is vulnerable and whether the urban system has the capacity to adapt. In addition, it may provide clues to understanding how disturbances modify the urban system and can help in the development of scenarios in order to estimate the impacts of disturbances upon it. It enables one to understand just how well a system that has been subjected to a disturbance may recover from its effects.

– *Provides a basis for the systemic analysis of cities and their vulnerabilities*

The term vulnerability, which is an essential component of resilience thinking, refers to the propensity of social and ecological system to suffer harm from exposure to external stresses and shocks (Dalziell and McManus 2004; Folke and Carpenter 2000). Research into vulnerability can, for example, assess how the disturbances will affect people and ecosystems and how sensitive urban communities and ecosystems will be to such changes in cities.

– *Increases the understanding of the dynamics of ecosystem services that improve human well-being*

Urban areas have always been dependent on their hinterlands for ecosystem goods and services (Folke et al. 1997; Rees 2003). The capacity of a city to provide these services, however, depends on the configuration of its ecosystems and cannot be taken for granted. Urban systems provide their inhabitants with a number of ecosystem services, some of which are essential for human well-being; however, they are not evenly distributed in space. Accordingly, urban landscapes must be planned to ensure the public has access to all important services, including those providing support (e.g. increased biodiversity, habitat, soil formation, ecological memory, seed dispersal, pollination and storage and

cycling of nutrients), culture (recreation, enhancement of property value, community cohesion, source of knowledge), basic needs (e.g. food, water, fuel) and regulation (noise reduction, modulation of temperature, removal of air pollution, protection of water quality, etc.).

It is also vital to ensure that the flow and access to ecosystem services is not interrupted. Andersson (2006) explains that by their very nature, many ecosystem services are highly subjective and likely to change and considers this as the main reason why resilient cityscapes with an ability to adapt to future needs should be maintained. Resilience thinking allows one to understand the dynamics of ecosystem services, since it involves the integration of ecosystem functions with social dynamics.

– *Concentrates on building capacity to deal with changes in the wake of different types of disturbances*

Resilience thinking seems to be extending the remit of planning to include activities in the wake of disturbances (e.g. coping/dealing with change when a disturbance has occurred). The basic idea is to accept the fact that the changes will take place, and while trying to reduce the risks, urban systems should be prepared to absorb these changes, reorganise themselves and develop new adaptive strategies to manage and cope with the change while sustaining their main functions. As mentioned above, these changes can be both slow transformations as well as major events, such as natural disasters, economic crises or social/political unrest.

– *Helps to link physical (spatial) and ecological aspects in a systematic way*

Resilience thinking helps to interlink the spatial dynamics that lead to different urban forms with respect to the vulnerabilities of urban systems. The concept of resilience (and sustainable development some years earlier) has given rise to questions related to the contribution and role of certain land uses and urban forms in creating cities that are more resilient (see Chap. 4). These questions have addressed a number of different spatial scales, from regional and metropolitan levels to the city level (e.g. Jenks et al. 2000; Gibbs 1997; Roseland 1997; Gordon and Richardson 1997). It is recognised that many of the debates about ideal or desirable urban forms are not new and often long predate discussions of sustainable development; some can even be traced back to the end of the nineteenth century at the outset of the garden city movement (Breheny 1997). However, following the resilience approach, sustainable urban development should also take into account patterns that provide capacity to the system to absorb disturbances and reorganise itself (Chap. 4).

1.4   The Structure and Basic Arguments of the Book

How can the above advantages of resilience thinking make the most effective contribution to urban planning? This book attempts to decipher the concept of resilience in urban policies and planning and attempts to develop typologies of cities and

their developmental trajectories based on their social, economic and ecological resilience. In doing so, the aim is to help decision makers avoid some of the more common traps/pitfalls. Considering the most common problems currently being faced in urban areas, promoting changes in policies and planning through resilience thinking is extremely important, and this is the main objective of this book. In order to achieve this, the intention is:

- To discuss the need for change in planning theory and practice and introduce the theoretical foundations of a resilience planning discourse
- To evaluate how far the existing models of planning and governance are able to deal with both slow and sudden changes and the increase in the numbers of crises with detrimental repercussions
- To explore how far the resilience concept has been reflected in urban policies and plans in different countries
- To introduce a methodology for the evaluation of how far existing plans and planning practices are able to create resilient urban areas
- To use this methodology to evaluate existing planning outcomes in different cities with the help of detailed case studies

Considering the current problems being faced in urban areas, learning from experience is extremely important; but what is even more important is promoting change in the policies and planning paradigm.

In this book, it is claimed that there is an urgent need to introduce a new planning paradigm since existing planning systems have experienced difficulties in preparing urban areas to cope with increasing economic, social and ecological pressures and disturbances. There has never been a better time for the introduction of the term 'resilience' and the adoption of 'resilience thinking' into planning.

Resilience thinking has very important merits that may be integrated into planning in two different ways (see Fig. 1.1): first, in the evaluation of existing plans, programmes and planning measures (post-appraisal approach) in order to identify shortfalls and, second, in the identification of critical issues in the urban system and the definition of key areas and issues in planning decisions prior to the setting of priorities and constraints (pre-appraisal).

In the post-appraisal type of approach, existing policies, plans and planning instruments can be examined for indicators of resilience – whether the plans and their instruments have been able to create resilient cities that are not only able to adapt to volatile conditions but also have the capacity for self-organisation and transformation. The indicators should be defined according to both the attributes of resilience relevant to the urban areas to be studied and the vulnerability of the urban subsystems. In this regard, the case studies of Lisbon, Oporto, Istanbul, Stockholm and Rotterdam presented in the book concentrated on how to use resilience thinking in the analysis of the plans and their outcomes with the help of the methodology introduced in Chap. 8.

We suggest that a similar way of thinking can be integrated into the planning process. In this approach, plans can be designed to enhance the resilience of the urban system, taking the attributes of resilience as the focal points and setting
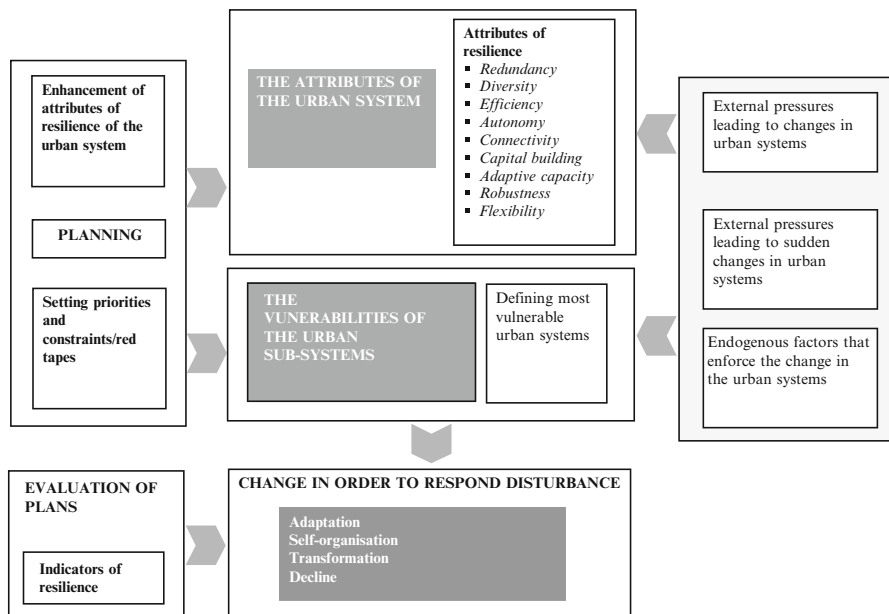
Fig. 1.1 The framework

priorities accordingly. The crucial point, however, is to identify the constraints and red tape that exist in the planning process, considering the long-term and co-evolutionary perspectives that integrate ecosystem functions with socio-economic and spatial dynamics.

In both approaches, there is clear need to consider the response of the urban system and its different attributes to the slow changes induced by endogenous processes but also to external pressures and disturbances that lead to slow changes as well as sudden impacts. As Fig. 1.1 clearly shows, the definition of vulnerabilities is a key step in this analysis.

The book contains case studies from five different European cities, namely, Istanbul, Lisbon, Porto, Rotterdam and Stockholm, all of which have their own unique dynamics and problems. These cities are from four different countries (Portugal, Turkey, the Netherlands and Sweden) that have important differences in planning systems. The different historical, cultural and geographical backgrounds of these countries offer a view of different planning practices that are rooted in more than one planning style. Sweden and the Netherlands share north-western European planning origins. The Swedish planning system incorporates two planning styles, both of which are considered as central to their approach: the *regional economic planning approach* and the *comprehensive integrated approach*. Comprehensive integrated approach dominates the planning systems at different levels in Sweden: from cross border plans to comprehensive municipal plans. In the Netherlands,

similarly *comprehensive integrated approach* is quite important besides the elements of *regional economic planning approach.* In fact, Dutch planning system is one of the most elaborate examples of the *comprehensive integrated approach* to planning, in which plans are more concerned with the coordination of spatial than economic developments. Portugal and Turkey are southern European countries but present important differences in their planning systems. The Portuguese planning system seems to have a strong *urbanism tradition, while* in Turkey the two styles are most evident: *comprehensive planning,* with emphasis on *land-use management,* and the *regional economic planning* (see Chap. 6 for detailed elaboration of different planning systems).

The use of case studies from countries with different planning systems and practice is very important, since the existing debates on urban policies, urban form and resilient urban systems are still far from being well developed, and empirical studies that discuss the relations of these three issues are few and far between. Therefore, the evaluation of planning practice of the case studies from resilience perspective is important to see how different planning systems respond to this issue.

The 14 chapters in this book are divided under three main topics, namely: Part I. Resilience, changing spatial dynamics and planning; Part II. Managing urban change: Current policies and instruments; and Part III. Evaluation of existing policy instruments for resilience in the case study cities.

Part I, containing three chapters, presents the theoretical debates on planning, resilience and urban form introduced in the book. In Chap. 2, 'Resilience thinking for planning', Eraydin emphasises the need for resilience thinking in planning and elaborates how this thinking may reflect on planning theory and practice. She highlights the need to define 'substance' together with the process and 'value systems' that define the basis of reaction to change resulting from external and internal dynamics. In Chap. 3, 'Conceptual overview of resilience: History and context', Taşan-Kok, Stead and Lu introduce the concept of resilience and provide a history of the conceptual development of the term, while showing how it has evolved within the framework of urban research. In Chap. 4, 'Urban resilience and spatial dynamics', Santos Cruz, Costa, Sousa and Pinho explore the relation between urban resilience and different spatial dynamics, concentrating on four types of spatial dynamics – compactness, shrinkage, polycentrism and sprawl. The relationship between each type and the concept of urban resilience is defined, pointing out the main attributes influencing the resilience of urban systems.

Part II is devoted to an analysis of the changes in urban policies and instruments in four countries (Portugal, Turkey, Sweden and the Netherlands) and contains an evaluation of the experiences of the five city regions in these countries on which this book is based. The three chapters in this section provide information on the countries and cities from which the case study areas are selected. In Chap. 5, 'Analysing socio-spatial vulnerability to changing drivers of globalisation in Lisbon, Oporto, Istanbul, Stockholm and Rotterdam', Taşan-Kok and Stead focus on the vulnerability of spatial systems under the effects of global change, focusing on five prominent cities in Europe that are undergoing neoliberal economic restructuring and socio-demographic transformations. The chapter presents the different responses to

the spatial vulnerabilities that have been created in the five cities. In Chap. 6, 'Systems, cultures, styles: Spatial planning in Portugal, Sweden, The Netherlands and Turkey', Morgado and Dias explore the cultures of planning and their backgrounds, acknowledging style, tradition or model. The study of the planning styles of four countries provides an understanding of the links between European and national policies, especially with regard to the emergence of resilience thinking in planning. In Chap. 7, 'Managing urban change in five European urban agglomerations: Key policy documents and institutional frameworks', Schmitt introduces the approaches to urban and, in part, regional policy in the five case study cities of Lisbon, Oporto, Istanbul, Stockholm and Rotterdam, drawing upon information contained within several key documents aimed at the management of urban change. Schmitt claims that the current operating institutional frameworks as regards policy delivery in the field of spatial planning in general, and land-use management in particular, differ enormously across these urban agglomerations. This complex situation, according to Schmitt, makes comparison difficult but also allows one to view a wide spectrum of policy contexts.

Part III comprises the case studies conducted in the five city regions. In Chap. 8, 'Evaluating resilience thinking in planning', Pinho, Oliveira and Martins provide a theoretical and methodological framework for the assessment of resilience from different perspectives, which is used in the following chapters. They describe in considerable detail each step of the assessment procedure and present a critical appraisal of the applicability and usefulness of the resilience concept. The empirical chapters (Chaps. 9–13) utilise the method introduced in this chapter with certain modifications, using different attributes of resilience. In these chapters, the selected attributes differentiate considerably, since the case studies presented in each of them are based upon arguments reflecting the diverse nature of the case study areas.

Chapter 9, 'Assessing urban resilience in the metropolitan area of Lisbon: The case of Alcântara', by Dias, Morgado and Costa, is a case study of an ongoing urban project in Alcântara, where the social fabric has undergone a shrinking process and where a metropolitan centrality is envisaged. It contains an assessment of the existing plans and policy documents with respect to urban resilience, with emphasis on the attributes of *connectivity* and *adaptability*. The main findings, supported by various indicators, show that, should the plans be implemented, they will help change the existing trend of shrinkage into a process of urban reconversion, with positive impacts on the built environment and the social fabric.

Chapter 10, 'Evaluating urban policies from a resilience perspective: The case of Oporto', by Oliveira, Martins and Santos Cruz, presents the results of an application of a methodological evaluation of land-use policies from a resilient perspective from a case study of the *Baixa* District, located in an urban heritage area in the centre of Oporto. In the study of such a vulnerable area, *recovery and capital building* is given due consideration in the light of the area's socio-economic structure. The findings indicate that the existing problems, rather than being restricted to the physical dimension, are very much integrated with social issues. The implication is that social problems can only be tackled when all dimensions are

considered; and only when all the different dimensions are taken into account the regeneration of the area can be sustained, thus promoting urban resilience.

Chapter 11, 'The evaluation of different processes of spatial development from resilience perspective in Istanbul', introduces two case studies from the Istanbul Metropolitan Area, where two different urban processes are taking place simultaneously, namely, the intensification of the inner core and the formation of new urban nodes on the periphery. These two projects are evaluated using the related indicators of the five attributes of resilience, being *transformability, adaptability, recovery, flexibility* and *self-organisation*. The findings indicate that while the urban economic system and spatial system were able to respond to major disturbances, the new conditions also triggered changes in the built environment and in the social and economic structures that have made the metropolitan area even more vulnerable to major pressures.

Chapter 12, 'Polycentricity and urban resilience: The case of the Stockholm urban agglomeration', makes an assessment of the practical implementation of a polycentric strategy in the Stockholm urban agglomeration using the notion of urban resilience as the empirical framework. Schmitt, Greve Harbo, Tepecik Diş and Henriksson illustrate the need to broaden the current understanding of resilience in actual land-use planning to one that views the governance system as a resilient structure that is *flexible* and *adaptable* to rapid changes. The experiences and learning processes of local and regional planners in their attempts to apply and following up the concept of polycentricity in the Stockholm region since the idea was first introduced in 2001 are discussed.

In Chap. 13, 'Urban resilience, climate change and land-use planning in Rotterdam', Stead and Taşan-Kok investigate the ways in which *mitigation* and *adaptation* activities form part of the planning policy in Rotterdam, a city that faces significant threats to its long-term resilience, particularly due to its vulnerability to the impacts of climate change. The high risk of flooding in Rotterdam has resulted in the relatively rapid introduction of the term into Dutch special policy and the creation of urban plans and strategies. However, urban resilience still remains as a fuzzy concept in the Netherlands, and as the Rotterdam experience shows, the concept is still too vague to be of practical use. Chapter 14 is devoted to the conclusions and evaluations of the outcomes of the book. In this final chapter, the contributions of the debates and case studies are introduced under the three headings: contributions with respect to the conceptual framework, methodological contributions and contextual contributions.

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Chapter 2
"Resilience Thinking" for Planning

Ayda Eraydin

2.1 Introduction

Since the late 1970s, neoliberalisation and market-friendly policies have been affecting the way cities develop and function. Neoliberal principles based on market reliance seem to take over or manipulate the decision-making powers in urban development and create uncoordinated state interventions (Peck et al. 2009). Increasing neoliberalisation and entrepreneurialisation cause serious problems in the governance of cities, while the responsibilities, tasks and developments of the public sector are decentralised or privatised; economic activities are deregulated, and welfare services are replaced by workfarist social policies that favour innovative and competitive economic development (Purcell 2009; Leitner et al. 2007; Harvey 2005; Jessop 1993). In this new system of sensitive balances, entrepreneurialism, consumerism and property-led development have been accelerated, turning actors in the urban land and property market into key players in urban development.

It is clear that the neoliberalisation of social, economic and political processes affects not only urban development and governance but also planning discourses and practices, which are pushed in more market-oriented directions. This leads to a fragmentation of the variety of planning approaches to the neoliberalisation of dominant economic policies in urban areas (Purcell 2009), and the forces of neoliberalisation slowly take over each planning subfield. Since the 1980s, it has been possible to observe uncoordinated and even chaotic actions of fragmented public policies, programmes and projects, as well as plans. Increasingly opportunity-led

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approaches of planning institutions and an unequal redistribution of benefits and welfare as a result of the deregulation of the property and land markets became the main facets of the contemporary period. This situation came about mainly due to the blurred boundaries between the public sector and private markets, and the resulting vague position of planning institutions (Alexander 2008).

There has been an increase in the number of disturbances that put significant pressure on urban systems. As urban systems become more open to global pressures, urban ecological systems are affected more by global growth dynamics. This not only increases their exposure to ecological pressures but also hinders the sustainability of economic and social development. The concurrent economic and environmental crises experienced in recent decades have enhanced the perceived sense of vulnerability and have "increased [the] sense of risk and the perception that processes associated with globalisation make places more permeable to the effects of what were once thought to be external processes" (Christopherson et al. 2010: 3).

Unfortunately, planning practice has been unable to satisfy the needs, and existing planning theories have failed to come up with a framework to deal with the increasing vulnerabilities of urban areas and cities and the insecurities of the public. There has been increasing criticism of the communicative planning approach, which is rooted in a Habermasian ideal of communicative action (Albrechts 2010; Fainstein 2000, 2005; Purcell 2009; Harris 2002; Young 1996, 1999; Mouffe 1999), with criticisms focused on the priority given to processes instead of substance and the limited attention to power relations and the underlying causes of inequalities.[1] It has also been suggested that communicative action tends, in the long term, to reinforce the current status quo and is "more likely to support the neoliberal agenda than to resist it" (Purcell 2009: 141), because it seeks to resolve conflict, eliminate exclusion and neutralise power relations, rather than embrace them as the very terrain of social mobilisation (p. 155).

These criticisms are not related to the essence of the theory but to how it has been put into practice and used. The very recent combination of environmental, economic and social crises, however, indicate the need for a rethinking and questioning of the basic assumptions of contemporary planning theories, since it has become increasingly evident that in order to tackle economic, social and ecological risks that increase the vulnerability of the urban systems, a new theoretical perspective in planning is a necessity.

Such a new planning perspective needs to consider the increasing weakness of cities with respect to economic, social and ecological pressures and threats; to pay attention to the growing concerns on risks in the globalised economic system; and to bear in mind the processes that misguided development under the hegemony of

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[1] Some of the criticisms have been responded to by Healey (2003), who indicates that substance and process are not separate spheres, but rather are co-constituted. Forester (1999: 263) also indicated that the inclusiveness of the process may balance the power differences.

capitalism, which increased the vulnerabilities of urban spaces and communities and caused urban areas to be increasingly under the risk of losing adaptive capacity to deal with necessary changes.

Resilience thinking constitutes an alternative approach. "Planning for resilience" can find a home in planning theory as an analysis of the external dynamics that accelerate urban economic, social and spatial vulnerability and as an approach that helps to link social and economic processes with ecological processes, calling for a reconsideration of the "substance" of planning so as to enhance capacity to deal with slow and sudden changes of different forms. This can occur within a process that focuses on "building a self-organisation capacity" alongside a change in the value system that can overcome the unequal power relations.

This chapter opens a discussion on the contemporary dynamics of urban systems in the wake of different disturbances, with the aim being to evaluate the existing planning approaches and to discuss to what extent they are able to prepare urban systems to weather unforeseen disturbances. The major hypothesis of the chapter is that neoliberalisation accelerates the vulnerability of the urban systems and existing planning discourses and practice are not able to solve emerging problems. Therefore, there is need of a shift in planning paradigm, if we are seeking for more resilient cities. The main part of the chapter, however, offers a description of resilience planning and its principles in changing environments where the future is unpredictable and surprise is likely.

2.2 How do Global Economic Changes Affect the Vulnerability of Urban Systems?

In recent decades, cities and regions have endured significant changes under the dominance of the neoliberal agenda, which has eroded their resilience (Hudson 2009). Changes in production structures and labour processes under the pressures of globalisation, the rise of new technologies and the increasing role of knowledge and learning processes have brought about substantial changes in the built environment, lifestyles and patterns of consumption. This has affected cities and regions both directly and indirectly, while deregulation in different fields has eroded their self-regulatory capacities (Albrechts 2010). Increased incorporation into the new global economy has brought vulnerabilities that are amplified by the structural problems of cities, thus opening the door to external pressures.

While economic and social vulnerability have been the subject of broad discussions with reference to financial and economic crises and the domino effect among cities and regions all over the world, democratic deficits and vulnerability in governance have been widely disputed, with reference to the transfer of power from democratic citizens to corporations and the privatisation of the state (Albrechts 2010). In particular, the transfer of decision-making powers to the actors in the market has been the subject of much disparagement.

Moreover, ecological/environmental vulnerabilities have escalated with the movements of pollutants and hazardous wastes, as well as increasing numbers of

disasters accelerated by the overuse or misuse of natural resources, besides the unforeseen effects of climate change.

Urban areas have responded to these issues in an awkward manner since they lack experience and preparedness. For this reason, it is not known if the responses of the recent past have enabled cities to endure under the new conditions, or whether they have provided and motivated them to create new opportunities. There is a clear need to discuss the ways in which different stakeholders have reacted to these changes and to assess the outcome of their responses, which is what this book sets out to achieve through an analysis of five case studies.

2.2.1 Increasing Economic and Social Vulnerabilities in the Neoliberal Era

Since the 1980s, major metropolitan areas in the world have seen a significant restructuring of their economies in order to adapt and compete in the newly emerging conditions and risks in the global economy. While the deregulation of the flow of goods, capital and people decreased the level of protection of local economies to external affects, the volatility of the global economy intensified the vulnerability of urban systems. Today, major cities all over the world are facing pressures that are forcing them to rethink the impacts of policies aimed at competitiveness and integration into global economy on their socio-spatial structures, following a period of entrepreneurial policies shaped by the notions of globalisation and competition (Fainstein 2001; Boddy 2002; Boddy and Parkinson 2004; Buck et al. 2002).

Competitiveness is expected to contribute to the economic performance and welfare of cities, firstly by enhancing attractivity for international capital; secondly, to enable local agents to export their products and services all over the world and join global value chains; and thirdly to acquire global functions that will allow them to benefit from the spillover effects of the global circulation of knowledge, information and technology. Previous literature offers a very broad list of the benefits of competitiveness that are grouped under several headings: increasing human capital (Porter 1990; Lever and Turok 1999; Huggins 2003), improving quality of technical infrastructure and the standard of living (Kresl 1995; Storper 1997; Begg 1999; Malecki 2002; Camagni 2002; Turok 2004) and boosting local institutional and social assets, including effective governance (Kresl 1995; Krugman 1996; Deas and Giordano 2001). Competitiveness can be attained through the use of different assets that define to what extent a particular city is able to integrate into the global economy. However, the existing assets of competitiveness can quickly be eroded, since their effects may differ from place to place. More importantly, the reliance on global conditions and the dominance of deregulatory measures make cities and regions vulnerable in economic terms. The financial crisis of the recent past has led to deep economic problems in many countries, which is just one example of how problems in local economies can easily disseminate within the global economy and can cause complications even in countries with relatively stable economies.

Moreover, the dependence on global markets and the conditions imposed by global capital has also very important implications on social resilience through the labour markets. Recent literature has underlined the importance of the characteristics of the labour market and consequently the social and institutional relations of different social groups, which define the social resilience of cities (Gordon 2005; Fainstein 2001; Turok 2005).

The labour force is an important competitive asset, as its size, characteristics and quality determine the level of competitiveness of a certain city and its integration into the global economy. Competitiveness, thereby, theoretically means demand for labour and increasing job opportunities; however, an increase in employment opportunities does not necessarily mean that all groups will benefit equally. The characteristics of the labour markets are important in the transfer of the positive outcomes of competitiveness to different social groups. Several issues that shape labour markets, such as education, gender division of labour and the social organisation of work, are important in redefining the impacts of competitiveness on different labour segments, since the skills and occupational composition of the new labour market define which groups will have an access to new job opportunities. Increasing competitiveness may support inclusionary processes with increasing social cohesion, but at the same time, it may encourage a widening of inequalities (Turok 2005). In general, there is near consensus in the belief that neoliberal economic restructuring has increasingly shaped policies to benefit capitalists rather than citizens. This has led to an increase in social vulnerabilities, exemplified by decreasing social cohesion and socio-spatial segregation in urban areas.

2.2.2   *Increasing Environmental and Spatial Vulnerabilities Due to Changes in Property Markets*

Similar to the effects of restructuring, the last three decades have also witnessed important changes in regulations defining the transfer of rights to private property (Newman and Thornley 1997). Beginning in the 1980s, during the systematic restructuring of the economic infrastructure of major urban regions in an increasingly neoliberal tradition, local governments began to mobilise new strategies of endogenous economic development to cope with place-specific socio-economic problems, to adjust to newly imposed fiscal constraints and to attract new sources of external capital investment (Brenner 2006, ref. Eisenschitz and Gough 1993). Territorial competitiveness becomes a new priority in metropolitan governance, resulting in the formation of new forms of governance with spatial interventions (project- or property-led development), such as policy instruments for social and economic development and redevelopment. As many studies explain (Swyngedouw et al. 2002; Salet and Guallini 2006; Salet and Majoor 2005; Albrechts 2006; Taşan-Kok 2008), the new modes of governance introduced into the property markets have brought substantial changes to the political, economic and social power relations in the city.

After a period of heightened entrepreneurialism in the 1990s, the dualistic nature of property rights regimes became more obvious, with the *entrepreneurial mode of governance* focusing on the transfer of land rents for productive purposes (new forms of capitalist development, commercial property development, etc.) and the *social mode of governance* endorsing property development for reproductive purposes (for households), and the clash of these two regimes, which have different socio-economic logics (Jager 2003), helped to increase fragmentation within urban areas. There are a number of studies that reflect upon the interaction between the social and entrepreneurial forms of governance via the land and property markets, as well as the socio-spatial fragmentation, as an outcome of the interplay among them (see Webster 2002; Edwards 2002; Delladetsima 2006). Webster (2002) claims that the property market reproduces more visible "clubs" in this respect when compared to the social forms of governance that constantly establish new sets of relations and dynamics in cities. These institutional relations and the dynamic interactions between the property market and urban government actors (public and private) define their new roles in the property markets through negotiations, written-unwritten or official-unofficial deals and agreements and strategies. This entrepreneurial logic, however, decreases the opportunity for public concerns and long-term strategies for the sustainable use of resources to be addressed, and without doubt degrades the resilience of cities.

2.2.3 Democratic Deficits and Vulnerability in Governance

In the neoliberal era, one of the most dominant changes has been the privatisation of the state through the transfer of its functions to semipublic or private bodies. Services have been contracted out to volunteer organisations, community associations, non-profit corporations, foundations and private firms and through the creation of different types of quasi-public bodies and public-private partnerships (Albrechts 2010). The growth in the number of organisations taking part in the decision-making mechanism has created the illusion of equal opportunities in decision-making processes, but only when the power relations are not considered in the analysis. However, there is increasing evidence of unequal power relations and transfers of power from the public to corporations, leading to criticisms that "what is introduced is only for the legitimation of the existing system and managing economic stability" (Albrechts 2010: 1115). There are also many arguments indicating that neoliberalisation produces important democratic deficits. According to Purcell (2009: 141), "the system introduced easily can turn to more authoritarian, although they use democratic rhetoric and practice and use them to legitimate neoliberalism". This crisis in democracy is also mentioned by other scholars when focusing on the effects of politics and government on society. Innes and Booher (2010: 29) discuss the "the problems of the current practices and institutions that lead to disengagement and apathy of the society on democratic participation".

The above debates are very important, since beginning from the 1980s onwards, the participatory practices and the new quasi-public bodies have been cited as key

agents in increasing the level of democracy. However, in practice, the achievements have been far less than expected. In particular, the limited opportunities to resist the outcomes of the restructuring imposed by globalisation have received broad attention in the recent past, which has been indicated as the reason for the increasing vulnerability of the existing decision-making systems and institutions.

As can be seen in the case studies from four different countries featured later in the book, cities and countries with institutions that are not prepared to handle different forms of crisis are disproportionately vulnerable to external shocks, threats and disturbances. The World Bank Report 2011 emphasises the importance of institutional strength, together with the difficulties faced in transforming the existing institutions to allow them to cope with the global changes and economic crisis conditions. In this context, an institutional transformation that results in security, justice and jobs is suggested. Moreover, there is emphasis on the role of regional and international activities to reduce external stresses and specialised external support (World Bank 2011). It is obvious from recent global ecological events that institutional capacities are lacking, confirmed by the poor institutional performances in the wake of Hurricane Katrina in the USA in 2005 and the earthquake and subsequent tsunami in Japan in 2011.

Unequal power relations and the privatisation of the state through the transfer of functions to semipublic and private bodies make proactive measures to unexpected crisis and hazards difficult. Only in certain countries, where the threats are more obvious, such as the Netherlands, is it possible to initiate governance practices towards achieving resilient cities.

2.2.4   The Impact of Changes on Increasingly Vulnerable Urban Ecosystems and the Sustainable Use of Urban Land

The changes defined above clearly impose pressures on urban ecosystems by creating new demands for land and more ecological services. The different implications of the growth of cities and the growing demand for land are discussed under different headings. Air pollution that exceeds the carbon uptake levels of forests, the appropriation of green areas for development and traffic congestion are some of the issues that have received growing concern. Most empirical studies concentrate on the costs of sprawl, which are grouped by Ewing (1997) as more vehicle miles travelled, high energy consumption, air pollution, higher costs of infrastructure and public service provision and the loss of resource lands. In this respect, protecting the ecological balance (Wheeler 2007) and the efficient and sustainable use of land have become the main points of concern on the urban environment agenda, besides other environmental issues. That said, sustainable urban development and the sustainable use of land are not a new issue, having become a topic of interest when the appropriation of agricultural land for urban use began to be a problem for the sprawling cities. Sustainable urban development is used within the framework of preventing low residential densities, sprawl, leapfrog fragmentation of urbanisation,

suburbanisation and rapid development at the urban edge, while compactness and urban intensification, high density living, mixed land uses, recycling of urban land and brownfield regeneration began to be seen as more sustainable ways of land use development in the cities (Dixon et al. 2007; Thornton et al. 2007). Literature on sustainable land development at the beginning of 2000s emphasised new land planning and management methods to minimise the impacts of agricultural land loss through sustainable land allocation (Yeh and Li 2002; Ligmann-Zielinska et al. 2008; Enemark 2004). Urban form is a widely discussed issue in literature. Theoretically, one urban form can be more sustainable than another, though empirical findings show that there is no complete agreement on which forms are more sustainable.

In recent years, the recycling of urban land (especially in brownfield zones) received strong emphasis in the attempts to reduce the urban sprawl that was accelerating to address the increasing demand for land in competitive urban areas (Dixon et al. 2007). In fact, brownfield regeneration (Thornton et al. 2007), the recycling or reuse of the urban vacant land, became the primary means of sustainable urban land use in literature around the world[2] (Greenstein and Sungu-Eryilmaz 2004; Bowman and Pagano 2004; Brachman 2004; Shutkin 2004), alongside policies favouring compact cities.

The Compact City form was one of the recommendations of the Brundtland Commission Report, dated 1987, and a proposal of the UNCED Agenda 21 (UNCED 1993). In the European Charter II, which was adopted on 29 May 2008 by the Congress of Local and Regional Authorities of the Council of Europe, the Compact City was defined as an important international goal for the sustainable development of urban areas.

Recently, discussions on sustainability have been connected to those on global warming and climate change, with the growth of energy consumption of different forms and emissions, and their association with climate change, becoming a widely debated issue in urban environment literature. The new urban forms shaped under market dynamics have been considered inefficient and unsustainable due to their high energy consumption. In many cities, the increasing built-up areas in water basins, urban growth towards environmentally sensitive areas and the loss of areas with rich biodiversity are some of the consequences of neoliberal urban policies and their emphasis on prioritising entrepreneurial concerns.

The vulnerability and impact of already-foreseen threats to ecosystems are an indication of the seriousness of recent environmental problems. The impact of high rates of growth in land demand and urban sprawl on freshwater ecosystem/water resources are discussed with reference to uncontrolled built-up areas in protection zones of water basins, which leads to a loss of drinking water resources. Natural

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[2] Governments adopted targets for the proportion of housing development on reused urban sites. For example, in 1995, the UK Government decided that 50% of all new residential development should take place on reused urban land by the year 2005, and this target was further raised to 60% in 1996 in a more radical move towards a tough compaction policy (Breheny 1997: 210).

hazards, especially floods, and earthquake risk areas are under the pressure of property development, similar to forests and agroecosystems in many cities.

2.3 Urban Planning and Policy in the Era of Globalisation: How Far are they Able to Prepare the Urban Systems to Unforeseen Disturbances?

How do planning systems respond to increasing economic, social and ecological vulnerabilities intensified within the period of the neoliberalising economic system? In order to answer this question, first there is need to discuss the interconnections between the dominant mode of regulation and planning discourse in different economic regimes.

While the contemporary idea of planning is rooted in the *Enlightenment* tradition of modernity, in the twentieth century, *Mannheim's* ideas on planning that attached systematised social scientific knowledge and techniques to the management of collective affairs in a democratic society became the source of inspiration for the *Chicago school* of rational decision making. Later, the attempts to systematise core areas of knowledge in urban development led to the *rational planning model*, which became a guide in the planning profession and an approach to problem solving in the public sphere, beginning in the 1950s. *Instrumental rationality* dominated planning theory for more than 20 years. By drawing on Keynesian economics and policy studies in political science, it highlighted planning's role as being to correct market failures related to externalities, public goods, inequity, transaction costs and market power (Shiftel 2000). In this period, the rules were set out for welfarist redistribution, and governance mechanisms emerged to legitimise the distribution of welfare services among different social groups. Most of the existing literature has defined the governance practices of the *Keynesian* period as idealised forms that obscured the different mechanisms that have been used by the system to work under the pressures of different interest groups.

The *Keynesian* economic model, supported by the strong state and modernist ideas and rational decision making, faced important criticisms from the 1960s onwards. Literature on urban movements from the 1970s and early 1980s provides a clear indication that not everything was acceptable in the urban areas of the welfare states of the Western world (Castells 1983). Social movements were important in calls for participation, protest and the demand for a structural transformation of the urban system (Castells 1977). Due to conflicting interests and efforts to benefit more from the welfare delivery and transfer of rights in the property market, tensions and struggles grew among different groups. Struggles around *collective consumption* (i.e. the consumption of services produced, managed and distributed on a public basis) played a major role in shaping new planning theories, and were important in driving so-called *reforms* in planning systems.

Fainstein (2005: 124) explains that, "The reform movement was attacking the prevailing rational or quasi-rational model on two grounds: first, it was a misguided

process; and second, it produced a city that no one wanted". The *reformers*' emphasis was on the roots of urban inequality and they sought ways to achieve democratic participation in urban planning. According to Outhwaite (1994: 6), the underlying theory of *communicative rationality* was the preoccupation with the idea that instrumental rationality, seen as a liberating force at the time of the Enlightenment, became a source of enslavement in the 1970s.

Problems in the Keynesian mode of regulation necessitated a change in the rationality on which planning was based. The *Habermasian communicative action theory* was explicitly intended as an alternative to the instrumental or strategic rationality of capitalism (Habermas 2001: 102 cited in Purcell 2009). *Communicative action* aims at creating "the ideal speech situation", which constitutes "undistorted communication", in which all participants affected by the decision participate in it meaningfully, and everyone has an equal chance to participate in achieving the good for all rather than their own particular self-interest (Habermas 1990, 1993). He claims that it may be possible to achieve the desired end because through mechanisms of interaction, which theoretically include all partners (Purcell 2009: 149).

There appeared different schools of thought under *communicative rationality*, varying between *advocacy planning* (Davidoff 1965); *participatory planning* with emphasis on negotiation (Susskind and Cruikshank 1987); *communicative planning,* rooted in communicative action and decision-making practice based on communication and consensus building (Susskind et al. 1999; Forester 1999; Innes 1995); *transactive planning* (Friedmann 2008); and *collaborative planning* (Healey 1997). All are based on consensus building among people with conflicting interests, and can be accepted as variegated forms of planning based upon a communicative rationality.

Today, the ideas of both *communicative* and *collaborative planning* occupy an extremely hegemonic position in planning theory (Purcell 2009; Tewdwr-Jones and Allmendinger 1998); however, there have been growing criticisms in recent years that can be grouped under three main headings: first, theories that are based upon a *communicative rationality* are focused more on the process but less on outcome, and fail to acknowledge and account for the influence that external forces have in shaping decisions and outcomes; second, in *communicative planning,* scientific information may be marginalised in collaborative decision-making processes as individual participants often lack technical expertise, and thus it depends upon socially constructed decisions that are not necessarily made for rational reasons (Hillier 2003); and third, they neglect the power problems in the communication process and fall short of adequately accounting for the role that power inequities play in shaping outcomes (Fainstein 2005; Murray 2005). According to Purcell (2009: 141), *communicative action* reinforces existing power relations rather than transforming them, and he claims that communicative action and planning is embedded with the problems of power, indicating that those with stronger power relations have the opportunity to look after their own interests.

At present, the criticisms on theories on communicative action are not against what it stands for but rather its position concerning the neoliberal political-economic agenda.

Recent debates on the contemporary theory represent different positions. Firstly, *communicative action planning* is useful in harnessing the impacts of neoliberalism, and secondly although *communicative action* theory was not intended to serve the interests of the power, it provides a good ground for neoliberal practices to be legitimised.

Purcell (2009: 147) claims that "communicative planning offers an extremely attractive way for neoliberals to secure the democratic legitimacy they require, because it tends to reinforce the political-economic status quo while producing democratically legitimate decisions". Comments have been made indicating that *communicative action* tends in the long term to reinforce the current status quo and suppresses the radical and transformative edge in practice (Harris 2002), favouring some social groups and not others (Young 1996, 1999; Fainstein 2000; Albrechts 2010). Flyvbjerg (1998: 209) also expressed "scepticism about the non-politicised processes of mediation and building consensus", and further limitations of *collaborative planning* are defined by Gunton, Peter and Day (2006), such as the limited applicability to only those cases where all relevant stakeholders are motivated to participate and/or management agencies that are willing to delegate power. They claim that inequality in power gives some stakeholders an unfair advantage and a propensity to develop "second best" or vague outcomes in order to achieve consensus.

Some changes have been introduced to counter this argument in the recent past. Healey (1997) argued persuasively that the challenges of urban development in the neoliberal era could no longer be handled effectively by government alone, but required the participation of all sectors of society in a form of planning that involved dialogue and negotiations among stakeholders to achieve an actionable consensus. She emphasises that communicative action aims not only at creating a cohesive "we" but also to generate an inclusive system in which nobody affected by a decision should be excluded from the decision-making process (Healey 1997). The problem with this ideal, critics argue, is that such inclusiveness can never be total, as every group that includes must always also exclude. However, there are yet newer discussions that favour *communicative planning* and governance, with claims that it can enhance the resilience of cities (Innes and Booher 2010).

A careful examination of the problems of urban areas in the contemporary period and the criticisms of dominant planning theories lead to a realisation of the need for a new mode of thinking in planning. While the problems of planning theory in terms of its use in the neoliberal era is one of the first points in the new thinking, decreasing the power of planning to harness unexpected economic, social and ecological problems constitute the latter. Christopherson, Michie and Tyler argue (2010: 3) that the "resilience debate can shake up our thinking and make us question some of our basic assumptions and measures of success and failure". It can also can take "decision makers, planners, institutions, and citizens out of their comfort zones, and compel them to confront their key beliefs, to challenge conventional wisdom and to examine the prospects of *breaking out of the box*" (Albrechts 2010: 1115).

2.4 Resilience Thinking as the Basis of a New Paradigm in Planning Practice

In this book, it is claimed that it is possible to introduce a new planning paradigm based upon the concept of resilience. This section of the chapter attempts to identify the basic characteristics of resilience planning.

As discussed in Sect. 2.2, increasing economic, social and spatial vulnerabilities due to incorporation of urban areas into the new global economy and opening the door to external pressures necessitate building resilient urban systems. The entrepreneurial logic in property markets decreases the opportunity for public concerns, and unequal power relations and the privatisation of the state make proactive measures to unexpected crisis and hazards difficult. Moreover, increasing ecological vulnerabilities require connecting planning and science of ecology and enhancing ecological resilience of urban systems, and considering the impact of already-foreseen or unforeseen threats to ecosystems.

A resilient system is defined by its two main features: its ability to absorb change and disturbance, and the persistence of systems while retaining its basic functions and structure (Walker et al. 2006); together with the ability to survive, adapt and transform itself (Ludwig et al. 1997). The attributes above define a possible choice in building a planning framework: whether to follow conservative or radical constructs of resilience (Raco and Street 2012). The former view of resilience allows a return to the steady state that existed before the external shock threatened to bring radical and fundamental change, while in contrast the latter interpretation sees resilience as a dynamic process involving the rejection of the status quo, as there can be no return to the circumstances that actually caused the problem in the first place (Raco and Street 2012).

The latter definition, accepted here as the core of the resilience planning paradigm, can be defined with respect to three dynamic assets of the urban systems: adaptive capacity, self-organisation and transformability, rather than characteristics connected to the steady-state condition.

The adaptive capacity, which is at the core of a new paradigm for planning practice, aims explicitly at equipping urban systems to deal effectively with slow and radical changes. Its application so far has been limited since it should cover responses to multidimensional issues that vary from ongoing environmental/ecological concerns, changes to the urban built environment, movements of people, evolving socio-economic regimes and the interplay of political ideologies and collective imaginaries. The enhancement of adaptive capacity is a necessary condition for reducing vulnerability, and sustaining ecosystem services is vital for many urban areas, which are under threat of significant upheavals from a variety of different hazards and problems induced by climate change. Self-organisation, which is a process of internal organisation within a system without being guidance or management by an outside source (Heylighen 2002; Holling 1992), establishes the arena for evolutionary change. However, self-organisation is not always possible, and systems have had to undergo thorough change. Transformability in such cases is inevitable, being

the capacity to create a fundamentally new system when ecological, economic or social (including political) conditions make the existing system untenable (Walker et al. 2004); and planning may play a vital role within this process.

Evaluating urban systems with respect to these assets enables one to determine the critical issues for resilience planning. First, it has to be dynamic, not seeking to return to stable equilibrium under external disturbances and changes due to local dynamics, but adapting and adjusting to changing internal or external processes. Secondly, it has to consider economic, social and ecological heterogeneity by concentrating on not only the form but also function and process of urban systems (Pickett et al. 2004). Thirdly, resilience planning needs to be based systems analysis, which will enable to define the points and issues of vulnerability of urban systems and to be focused on key issues, being those related to the adaptive and transformative capacities of urban areas in terms of determining strengths and weaknesses in the context of opportunities and threats.

What would be the main features of such a planning system? The basic characteristics of resilience planning can be defined in comparison to the two dominating planning paradigms, namely, rational comprehensive planning, which had been the basis of planning practice from the 1950s up to 1980s, and communicative planning, which has dominated new planning practices since the 1980s (see Table 2.1).

One of the critical issues to be addressed when defining a possible framework for integrating resilience thinking into planning practice is its rationality. Rationality in planning can be defined as the guiding principle of the human mind in the process of thinking and the application of reason to collective decision making (Faludi 1987). Planning literature argues that different planning paradigms are based on different rationalities and that finding a variant of planning practice is way of integrating the various types of planning paradigms associated with different forms of rationality (Alexander 2000). Alexander (2006) proposes a system of classification of rationality associated with different planning paradigms. Briefly, he defines instrumental rationality, corresponding to the logic of choosing the best means to achieve a particular goal; substantive rationality, demanding consideration of the goals themselves, selecting between objectives and assigning priorities; bounded rationality, providing a context to decision making; strategic rationality, making the decision maker and other actors interdependent; and communicative rationality, shifting focus from decision making to social interaction.

Resilience planning, as discussed earlier, needs a systems approach, defining means but not ends and flexibility that enables urban systems not only to adapt to but also can benefit from expected and unexpected disturbances. Therefore, the instrumental rationality, which is the basis of comprehensive planning, or communicative rationality that leads to communicative planning based on socially constructed values and social interaction do not offer a sound basis for resilience planning. Neither the bounded and strategic rationality that are mainly focused on planning as frame setting is able to serve the needs for resilience planning that aims not to provide means for clear ends, instead means for undefined ends to make sure the loss from unexpected event is minimal.

Table 2.1 The resilience planning paradigm and its major characteristics in comparison to rational and communicative planning paradigms

	Rational comprehensive planning	Communicative/collaborative planning	Resilience planning
Rationality	Instrumental rationality	Communicative rationality	Integrative rationality. A framework that combines instrumental and communicative rationality
Actors	Individuals/technicians	Individuals in interactive groups	Interdisciplinary groups with technical expertise. Social groups as learning agents of change
Relations between actors/issue of power	Defining goals for all	Consensus generation	Commitment
Time perspective	Medium to long term	Short term	Long-term perspective, systems approach and immediate action
Concern	Problem solving	Collective agreement/decision	Issues raised under the instrumental rationality act as constraints
Aim	Defining the most effective actions/to achieve goals	Consensus, mutual understanding	Defining priorities for a no-regret situation. Preparedness for both slow and major disturbances
Output	Decisions: based on technical knowledge	Collective decision based on socially constructed values	Flexible solutions depending upon spatial heterogeneity, function and temporal change
Context/substance	Comprehensive decisions	Context as an outcome of process	Red tape and priorities
Value systems	Individual values	Socially constructed values	Universal values for common benefits
Bases of evaluation of outputs	Efficiency	Consensus-based values	Resilience attributes

Therefore, planning based upon resilience thinking has to have an integrative framework that combines rational and communicative planning (see Table 2.1); with rational planning based upon instrumental rationality and communicative planning resting upon communicative rationality. As Alexander summarises (2000: 247), an integrated rationality is "a complex construct, a recursive process deploying different forms of rationality at successive stages by various actors in changing roles". Different than the two main planning systems, resilience planning that uses integrative rationality obviously necessitates not only actors as individuals but also individuals in interactive groups, in addition to interdisciplinary teams with technical

experience, to be involved within the different stages of planning practice. While the interdisciplinary teams engage in the planning practice to analyse urban subsystems and define the key vulnerabilities of the systems, the involvement of social groups as learning agents of change, however, needs to be based upon a *commitment* to prepare urban areas for long-term changes and disturbances. This point is quite important in resilience thinking since most of the consensus generation processes in communicative actions of the contemporary era are based upon short-term expectations and socially constructed values, disregarding long-term horizons and long-term commitments.

The concern of resilience planning should not be merely about problem solving, as the classical planning approaches are already focused on, or reaching collective agreement/decisions, just as communicative planning does. What resilience planning targets is defining *no-regret situations* under uncertain conditions, in which the outcomes of the specific models that links structures and processes in urban systems defined within the instrumental rationality can be used as constraints in the process of decision making. In this framework, the definition of the critical issues and an analysis of these issues using different methods of analysis, and problem solving defined under the instrumental rationality should act as inputs when defining the problem areas in the collective decision-making process.

In this regard, the aim of resilience planning is not to define the most effective actions to achieve goals within a comprehensive framework but rather to define priorities that ensure a no-regret situation and create a system that is not only adaptive to slow changes (mostly defined by endogenous dynamics) but also to major expected and unexpected disturbances. Such a system has to follow a co-evolutionary path in defining the impacts of disturbances or endogenous changes to its different components, as well as the secondary and tertiary effects of the changes taking place on each other, by integrating the ecosystem functions and socio-economic dynamics of the urban systems. This issue is at the very core of the resilience approach.

This way of formulating the aim of planning necessitates the use of specific models to determine how to measure resilience and knowledge to specify linking processes between social, economic and ecological structures in searching for mutual agreement, which should not only lead to binding decisions in certain priority areas, but also readiness to adapt to any slow changes or sudden pressures. Obviously, it is the content or the substance that becomes the main issue in this approach.

In fact, the resilience planning paradigm calls for a reconsideration of the "*substance*" of planning within a process, after several years of neglect. *Bringing back substance and context* based upon the vulnerabilities and adaptive capacities of urban areas, as the key goal of planning, is an important feature of resilience planning. It requires a definition of the substance and capacity (not end form and structure) defined with the help of red tapes and priorities as the bases for dealing with change. However, the wide variety of issues makes setting constraints and identifying red tape quite difficult, necessitating a critical analysis of the main processes and structural constraints shaping the urban areas, which obviously requires the use of methods of instrumental rationality. Moreover, defining *substance* and *end-capacity*

also necessitates a process of inclusive decision making that covers different groups – in other words, not only interactive communication but also deliberation.

The priority areas within this context have to serve for the enhancement of local creativity, innovation and risk taking, taking into consideration both proactive as well as transformative assets. In building resilient cities, proactive issues are important. According to Hudson (2009: 17), emphasis should be on moving to a proactive approach and learning how to anticipate and cope with a range of externally generated shocks and disturbances. However, a proactive perspective alone is not enough, as capacities for transformation and self-organisation are also needed if one is to reach the envisaged end state, which should include "the way resources are used, (re)distributed, and allocated, and the way regulatory powers are exercised" (Albrechts 2010: 1117).

The second issue is related to the value system, which is at the core of planning paradigms. Planning involves making choices in contexts characterised by complexity and uncertainty, and these choices are connected to value systems and ethical issues. Since the 1980s, while rational comprehensive planning became increasingly discredited and replaced by communicative planning, socially constructed value systems became important. As Campbell (2012: 2) argued, "the technocratic premise was replaced by widespread acceptance of the 'political' and therefore value-based character of the activities with which planners engage". Today, there are increasing criticisms on "the highly politicized nature of professional ethical frameworks and their tendency to support the status quo" as Marcuse (1976) pinpointed several decades ago. Interestingly, given the increasing market reliance of planning and hence the importance of judgement rather than technique, the debates on value systems and planning ethics are limited in the literature.

The use and redistribution of resources is not only a technical issue, in that it is directly related to the value system in which acknowledging the materiality of the economy and consumption, production and the division of labour are especially important. Moreover, establishing a new balance between private property rights and human responsibilities is the key issue in building a new value system in urban planning (Wheeler 2007). The critical issues are primarily the principles of sharing both burdens and benefits, and the problems in the provision of equal opportunities in circumstances characterised by competing interests and priorities. These issues are related to the major ethical concerns of planning, namely, equality, justice and public interest.

In recent sustainability literature, there is emphasis on defining planning principles for the more efficient use of urban land (Stallworthy 2002; Brachman 2004; Wheeler 2007) and calls for land-use control in both built-up areas and in the peripheral zones to help preserve farm land, ecological habitats and open spaces near cities, emphasising that the relations between people and the land should be altered. This type of individual calls for principles and many others and measures should be backed with clear ethical framework based upon the value systems not only socially constructed but also values that reflect more than normative concerns.

This shift is obviously not easy, in a period where market forces are the determining factors in urban change and transformation in a world of diversity and contested truths.

However, thinking of resilience of the urban systems and increasing evidence and problems on the planning based upon short-sighted visions and normative indicate that the importance of technocratic premises and universal values built upon the technical and scientific knowledge. The resilience planning paradigm proposed in this chapter suggests the need for a consensus on certain principles and values at the global level, which can be over the power struggles at different levels of governance.

2.5   Concluding Remarks

This chapter offers a summary of thoughts on a new planning paradigm to be based upon resilience thinking. The key principles at the heart of resilience planning are introduced, highlighting a need for a radical shift in existing planning practice and definitely a new perspective.

How can these principles be formulated with respect to global economic relations? There are different perspectives providing different answers to this question, such as "greater intra-regional closure of the economy and greater self-reliance", as Hudson (2009: 17) has suggested, or "relying on endogenous capacities", as claimed by Simmie and Martin (2010: 45–58). However, how far it is possible to "create more self-contained regional economies, while securing successful transition to ecologically sustainable and socially just forms of regional organisation, economy and society" (Hudson 2009: 17) is still an important question.

Although the above proposals can be evaluated as reflecting a radical perspective, there is no doubt that resilience planning necessitates an approach that begins with ethical considerations, which should be more than a mere discourse on the "common good" (Purcell 2009: 153). Besides advocating equity, empowerment and environmentally sensitive economic development, there is need to encourage a new ethics that is based upon the responsibility of everyone to protect him/herself, with the right to protest those who do not comply with the basic ethical standards (Hudson 2009: 19), which is a crucial factor in the way urban land and urban services, including ecosystem services, are used or provided.

Moreover, building a value system is very important if antagonism and hegemony of power on urban systems is to be reduced. If there is no value system defining the expectations for the future, then every agreement will silence some and not others, and every decision will favour some over others (Hillier 2002; McGuirk 2001; Tewdwr-Jones and Allmendinger 1998; Purcell 2009). As discussed earlier, without value systems, consensus or agreement stabilises power (Mouffe 2000: 104), which may have very negative consequences in the long term for different resources and the way urban areas are used.

While mainstream planning theory has focused on the procedural side of planning, recent problems and external developments on the substantive side are increasingly pushing the profession in new directions and demanding responses. It is claimed that planning practice should be clear about not only the processes but also the substance if resilient cities are to be created. Moreover, planning practice has to

find a balance between the rights and responsibilities of the different actors in order to create resilient cities for the future. Each actor, especially planners, has to confront their key priorities, beliefs and value systems carefully.

In this integrative framework, while a planning process that follows communicative rationality is to be used in shaping the planning process, the methods defined within the context of instrumental decision making can be used to define baselines or remove red tape so as to achieve no-regret conditions in the long term. The issues defined in the chapter necessitate a radical change in the approach to planning and in the principles not based upon problem solving or consensus building. The key task is to define the musts and the main attributes that the urban system has to achieve, which may be difficult, but is certainly not impossible.

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Chapter 3
Conceptual Overview of Resilience: History and Context

Tuna Taşan-Kok, Dominic Stead, and Peiwen Lu

3.1 Introduction

This chapter explores the historical roots of the concept of resilience in the context of urban planning. The simplest definition of resilience in this case is the capacity of a system to undergo change and still retain its basic function and structure after facing an external disturbance. This basic definition has its roots in applied sciences. In engineering, for instance, resilience refers to the capacity of a structure to withstand an impact without being permanently deformed (Callister 2000) while, in ecology, resilience is defined as the amount of disturbance that an ecosystem can withstand without changing its self-organised processes and structures (Holling 1973). Resilience has been used in wide range of areas, such as ecology, environmental and social sustainability, environmental sciences, hazard planning, ecosystem management, and even in supply chain risk research.

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Using the concept of resilience, some scholars have highlighted the characteristics of resilient systems as being able to cope with external shocks and surprises (e.g. Folke et al. 2002). The resilience of some systems it is argued, increases when a disturbance is experienced over and over again. Each time a system faces a disturbance, it gains more resistance and functions better when facing further disturbances. Thus, resilience is not just concerned with preventing disturbances: it is also concerned with adaptation to change. In the literature, emphasis has often been on preparation for and effective action after a disturbance occurs. However, urban land use planning is traditionally more concerned with taking action to minimise disturbances (e.g. avoiding "bad neighbour" nuisances through the separation of certain land uses; implementing planning policies that minimise energy consumption and CO_2 emissions) and reducing the risks and negative effects of any possible disturbances (e.g. locating developments away from ecologically sensitive areas or areas liable to flooding). Resilience thinking, in this regard, seems to be extending the remit of planning to include activities after disturbances (e.g. coping/dealing with change once a disturbance has occurred). The most basic idea is to accept the fact that changes will take place, and while trying to reduce the risks, urban systems should be prepared to absorb those changes, reorganise themselves, and develop new adaptive strategies to manage and cope with the change while sustaining their main functions.

In doing this, benefit may be drawn from the resilience approach in urban planning through a shift in policies, from those that aspire to *control* the change, to those that increase the *capacity* of the system to cope with, adapt to, and shape change. Following the theoretical elaboration of resilience thinking for urban planning in Chap. 2, this chapter provides an overview of how the concept has developed and how its ongoing evolution may change the context of spatial planning. A further elaboration of the concept of resilience with respect to spatial dynamics is introduced in Chap. 4.

3.2 Framing Resilience: Evolution of Resilience, from Ecological Sciences to Urban Planning

Definitions of the concept of resilience have undergone considerable amendment in recent years after becoming integrated into social sciences and planning literature following a four-stage path. First, resilience appeared as an ecological concept in the literature. Second, *system resilience* emerged as a concept in social sciences. Third, the *resilience of cities* as urban (ecological, social, and economic) systems came under scrutiny. In this field, a wide body of literature on social, economic, and ecological resilience of urban systems accumulated. Fourth, urban planning literature began to seek *principles for resilient cities*, with a shift in emphasis from coping with environmental hazards towards a more comprehensive approach that looks at the resilience of the urban system as a whole.

3.2.1 Entry Points of Resilience in Ecology

Resilience has a variety of disciplinary origins, with references found in the fields of biology and ecology, business studies, engineering and materials science, and psychology (see, e.g. Gunderson 2000; Holling 1973; Hyslop 2007). In terms of ecological stability theory, the concept of resilience was used for studying the interacting populations and their functional responses (Holling 1973; Folke 2006). Holling (1973: 33) took resilience as "the system to absorb the disturbances between efficiency and persistence, constancy and change, predictability and unpredictability, in order to keep equilibrium continuously". Pimm (1984) highlighted resilience as a measure of the "speed of return", which was developed later by Holling (1996) into "engineering resilience" (Pimm 1991; Ludwig et al. 1997). Resilience finds its most precise meaning in physics and material sciences (Shaikh and Kauppi 2010; Tarter and Vanyukov 1999), in which it refers to the elasticity of materials. A resilient material is able to resume its original shape or position after being bent, stretched or compressed (Callister 2000). As a material deforms past its yield point, plastic deformations will result. The yield point marks the transition from essentially elastic behaviour to plastic behaviour. After passing the yield point, the process is not reversible. Resilience means, thus, the capacity of a structure to withstand an impact load without being permanently deformed. In each applied scientific field, resilience refers to a similar characteristic of a physical property (of a material, surface, structure, or system) that can return to its original shape or position after an impact that causes deformation before exceeding its elastic limit (Callister 2000). With this simple principle in mind, a number of social scientists have begun to use the term resilience in studies of self-organising systems (whether a person, society, or ecological system, like a forest or a city) and their ability to withstand impacts (like a disaster, crisis, trauma, hazard, or threat) without being permanently deformed.

3.2.2 Entry Points of Resilience in Social Systems

Timmerman (1981) was one of the first authors to make the link between the resilience of society and climate change. Resilience, from this point of view, is defined as "the capacity of the system to absorb disturbance" (Wardekker et al. 2010 refer to this as the ability tolerate disturbance) and reorganise while retaining the same function, structure, identity, and feedbacks (Walker et al. 2004). Thus, the system is impacted but is able to reorganise and reform.

Across the many definitions, however, system resilience is commonly understood to entail both robustness or strength (i.e. the ability to withstand external shocks) and rapidity or flexibility, in response (i.e. the ability to bounce back). External shocks are usually defined as "disturbances" and are usually associated with hazards, disasters, or threats in literature. Pelling (2003), based on Mitchel (2001), clarifies that hazards, as human ecological interactions, can generate disasters. Hazards may harm individuals or human systems and can be everyday (e.g. scarcity

of clean drinking water) or episodic (e.g. volcanic eruption). Disaster, as defined by Pelling (2003), is a state of disruption to systemic functions. In this respect, economic or political crises can also be considered as disasters. Coaffee et al. (2009) define such disturbance factors as a "push for resilience", which exists as a response to "existential and material vulnerability, insecurity, and change". Moreover, risk is another factor that plays an important role in defining the resilience of a system. Although risks are mainly associated with environmental disasters and natural hazards (earthquakes, tsunamis, hurricanes, etc.), for urban systems, it is political, social, and economic disturbances (financial crises, political turbulence, or public unrest) that can be the main source of risks and vulnerabilities. For this reason, economic and social resilience has also appeared as an important dimension in the sustainability of cities. Social resilience is about building institutions for social reorganisation and collective action, robust governance systems, and a diversity of livelihood choices (Adger et al. 2005); while economic resilience is connected to coping with the slow and radical changes induced by the interaction of endogenous and exogenous economic and other related processes.

The increase in the number of disasters has enhanced the necessity of resilience in social studies. Ecologists also adopted studies of resilience in relation to social and economic development. Walker and Salt (2006) generated the concept of resilience to understand social-ecological systems following two approaches: the ability to cross the threshold and move into a different regime; and the metaphor of adaptive cycles. The former argues that social-ecological systems would cross a threshold and move into a different regime (Holling 2001; Walker et al. 2004; Folke 2006; Gunderson 2000), while the concept of adaptive cycles highlights that stable states would move variously according to the phase in which the system lies (Folke et al. 2004; Folke 2006; Walker and Salt 2006). In a large number of empirical studies on ecology, scholars argue that human societies today are "vulnerable" because they are too concentrated with managing the "fore loop" while neglecting to prepare the "back loop" for once it crosses the thresholds.

Tobin (1999: 13) defines sustainable, resilient communities as "societies which are structurally organised to minimise the effects of disasters, and, at the same time, have the ability to recover quickly by restoring the socio-economic vitality of the community". Vayda and McCay (1975) argue that culture would be seen as an equilibrium-based system. Subsequently, Lamson (1986) argued that coastal settlements in Canada, though small, were able to recover from disasters, while many planned communities, with modern infrastructures and large populations, were not self-sufficient once a disaster occurs. Zimmerer (1994) highlights that the concept of resilience (known as "the new ecology") has been deployed in human geography studies to define the carrying relations of capacity, diversity, and stability in human societies. In general, socioeconomic studies have adopted the concept of resilience mainly for cultural anthropology and environmental psychology. From this perspective, the main principle of a robust social system is seen as the capacity of society to rapidly recover from disasters. It is argued that "the longer it takes a community to 'bounce forward' after a natural or man-made hazard, the greater the risk of damage to the social fabric that holds a community or organisation together"

(Sapirstein 2006: 2). For this reason, some characteristics of urban communities, like social consensus and social capital building, which would help society to rapidly recuperate, are important. Linking particular forms of social capital to adaptive capacity in the case of dealing with risks of climate change, Adger (2003: 388) argues that inherent capacities of societies are bound up in their ability to act collectively. As also elaborated in Chap. 5, loss of collective action may increase the vulnerability in cities and thus may be a thread for system resilience.

3.2.3 Entry Points of Resilience in Urban Systems

A resilient system, according to Hudson (2010: 12), can be described as "an adaptive system that adjusts and responds in ways that do not damage or jeopardise effective functioning, remaining on an existing developmental trajectory or making the transition to a new one". Wardekker et al. (2010: 988) argued that resilient systems "can tolerate disturbances (events and trends) through characteristics or measures that limit their impacts, by reducing or counteracting damage and disruption, and allow the system to respond, recover, and adapt quickly to such disturbances". Just as there are many general definitions of *system resilience* (e.g. ecosystems, individuals, organisations or materials), there are also various definitions of *urban resilience*. Alberti et al. (2003: 1170) provide one such definition, describing resilience in cities (which might also be considered as urban resilience) as "the degree to which cities are able to tolerate alteration before reorganising around a new set of structures and processes". In common with the general definitions of system resilience (illustrated above), this definition seems to contain references both to robustness (or strength) and the rapidity of response to disruption. In Alberti et al.'s definition, tolerance to alteration refers primarily to the robustness of the city to cope with a shock, while reorganisation refers to the rapidity of response (and adaptation).

According to Godschalk (2003: 136), a resilient city is "capable of withstanding severe shock without either immediate chaos or permanent harm". This view clearly places more emphasis on the robustness of the city (and the mitigation of hazards) rather than the rapidity of response (and mitigation). Nevertheless, the reference to withstanding "permanent harm" indicates some consideration of the nature and timescale of change.

When considering any definition of urban resilience, it is important to distinguish between system equilibrium and resilience, which are not synonymous (as Holling was careful to point out in his account of ecological resilience in 1973). A resilient system may experience fluctuations or changes in conditions or structures, and these fluctuations or changes may provide the very basis for an urban system's persistence over time (Dudley 2010). In addition, urban resilience does not necessarily concern the ability of a system to return to a previous path of equilibrium after disruption or stress. Previous equilibrium paths may disappear for any number of reasons after a disturbance, and alternative paths may appear, all of which can change the trajectory or path of a system (Christopherson et al. 2010).

In common with a number of other policy concepts that have been applied to cities, such as sustainability or flexibility, urban resilience can be regarded as a guiding principle rather than an end state. Arguing that cities are complex social ecological systems that are constantly undergoing change and evolution, Gleeson (2008) contends that urban resilience provides a way of conceptualising and guiding this urban change and evolution. In his opinion, there is no single optimal state or definitive blueprint of urban resilience: the structure or form of a resilient city is a function of its particular path of evolution and its own capacity for adaptation. For Hudson (2010), the concept of resilience has found its way into policy literature as a normative goal of environmental management and a key component of sustainable development. While the term resilience is sometimes used interchangeably with sustainability, and they may be closely related in practice, they are arguably semantically and theoretically quite distinct (Dudley 2010).

The growth in interest in the concept of resilience is considered by some to be a response to a contemporary sense of complexity, uncertainty and insecurity, and a search for formulas for adaptation and survival (see Christopherson et al. 2010). In this respect, the fashionable use of the concept may originate both from an increased sense of risk (economic and political as well as environmental) and from the perception that processes associated with globalisation have made places and regions more permeable to the effects of what were once thought to be external processes.

3.2.4 Entry Points of Resilience in Urban Planning

In relation to spatial planning, resilient thinking was initially adopted to create "a place with resilience" at a level in the late 1990s. Resilient communities meant to be compatible with diverse value systems, have a high adaptive ability, and be able to adjust flexibly in social and institutional networks once disasters occurred (Tobin 1999; Mileti 1999). Compared with relevant concepts like landscape ecology and socioeconomic coherence, resilient communities were expected to detract from the vulnerability and recover from disasters within a short period of time. In other words, they would be stronger and more variable than non-resilient ones in dealing with disasters in many aspects.

It is widely acknowledged that spatial planning has an important role in promoting urban resilience (see, e.g. Fleischhauer 2008; Gleeson 2008; Davoudi 2012). This interest has stemmed from different standpoints. First, there is widespread recognition that the spatial configuration of cities and towns, and the way in which land is used and developed, has significant implications for both adaptation to the adverse impacts of climate change and the reduction of emissions that cause the change (i.e. mitigation). There is no consensus on this ecological perspective and whether planning should be concerned with adaptation, mitigation, or both, as different views can be found.

Some argue that mitigation is the principle task in planning. Fleischhauer (2008), for example, asserts that the most important role of planning is in mitigation – preventing and reducing damage to people, property, and resources before a disaster occurs. McEvoy et al. (2006) identify two key planning strategies for climate mitigation: (1) reducing the amount of energy required by end users (e.g. by improving the energy efficiency of buildings and transport systems) and (2) reducing the carbon intensity of the energy supplied (e.g. by increasing the use of alternative fuels).

Others argue that the key role for urban planning is in promoting adaptation. De Vries (2006: 225), for example, contends that "while spatial planning has something to contribute to the mitigation of climate change, the main challenge for planning is to help prepare for the impacts of climate change" (i.e. adaptation). Similarly, Gleeson (2008: 2653) argues that "new urban scientific evidence suggests that planning's principal role in the fight against warming will be one of adaptation not mitigation". Biesbroek et al. (2009: 234) primarily see "a prominent role for spatial planning in adaptive measures, such as water management".

What is clear is that efforts of adaptation and mitigation are not necessarily integrated or complementary, as they do not always work in the same direction. For example, policies for high-density mixed-use settlements (compact cities) have been developed across much of Europe (see, e.g. Williams 1999). Although urban consolidation can reduce energy demand and transport emissions, it can also be in conflict with the adaptation agenda by intensifying the urban heat island effect and posing problems for urban drainage (McEvoy et al. 2006; Boyko and Cooper 2011). Furthermore, cities that are poorly designed for hotter conditions and that inhibit natural indoor and outdoor ventilation (e.g. due to insufficient space between buildings) are likely to lead to a high demand for cooling and air-conditioning with additional impacts on climate change. There may also be indirect effects as a result of people escaping the uncomfortable conditions of the city, leading to increased transport emissions (McEvoy et al. 2006).

Second, the engineering interpretation of resilience leads to the study of disturbance events, and spatial heterogeneity comes subsequently as the development of the theory of complex adaptive system within the context of urban settlements. In contrast, resilient studies were proposed under the complex contexts of renewal, regeneration, and reorganisation following disturbances. Because the system may look similar, but in fact is no longer the same, resilience studies began to focus on "regimes" and "attractors" rather than "stable states" or "equilibrium", giving a sense of excluding dynamics (Folke 2006).

The third perspective, which is rather new, tries to answer how the concept of resilience might benefit urban research on the ground and how urban planning scholars, practitioners, and policymakers may integrate a perspective that presupposes uncertainty, heterogeneity, and collective entanglement. As discussed in Chap. 2, this new approach aims to develop answers to theoretical problems, ongoing environmental and ecological concerns, the changing urban built environment, evolving socioeconomic regimes, and the interplay of political ideologies, among various other things.

3.3 Attributes and Characteristics of Resilience: Defining and Measuring the Capacity of Urban Systems

Social scientists have become interested in understanding the characteristics of the "process of preparing the system" for unexpected events so that the system can still function after a disruptive event without losing its main characteristics. Resilient systems aim to build capacity to deal with change and vulnerabilities to different types of disturbances, whether they are environmental, ecological, social, economic, or related to governance. Like Godschalk (2003), other scholars (Klein et al. 2003; Walker and Salt 2006) have also attempted to apply certain principles and characteristics of resilient ecosystems to spatial and social systems in attempting to define the measurable characteristics of resilient cities and the capacity of urban systems. In defining attributes, the term is quantified by researchers as being able to tackle the capacity of urban systems. According to Godschalk (2003), these attributes include *redundancy*, *diversity*, *efficiency*, *autonomy*, *strength*, *interdependence*, *adaptability*, and *collaboration*, and a resilient city is expected to be able to adapt to uncertainty in terms of the required combinations of these attributes (Godschalk 2003; Fleischhauer 2008). Walker and Salt (2006) refer to these characteristics as "qualities" and add to them a social dimension. In their opinion, some of the main qualities include diversity, ecological variability, modularity, acknowledging slow variables, tight feedbacks, social capital, innovation, overlap in governance, and ecosystem services.

The cases presented in this book (see Chaps. 9–13) illustrate that some of these qualities can actually increase the resilience of cities to diverse vulnerabilities. These qualities include recovery, connectivity, capital building, adaptability, robustness, flexibility, and transformability.

Recovery is simply defined as the ability of the system to recover from a disturbance (see Chaps. 10 and 11) and refers to the ability of a system to respond to an event. In an ever-changing environment, a system must change in response to that environment in order to retain its advantage (Dalziell and McManus 2004).

Connectivity is the degree to which the nodes of a network are directly linked with each other (see Chaps. 10 and 12). In terms of resilience, connectivity embraces more than just the physical dimension, as it includes also the relationships between people and organisations. There are different opinions on the resilience of highly connected systems. Some authors argue that connectivity eases communication between systems as it ensures the exchange of information, capital, and goods (Cumming et al. 2005), while others claim that isolated systems may be more protected against epidemic catastrophes, economic shocks, and other systemic risks, as their isolation enables the development of local capacity, diversity, and innovation oriented towards daily needs (Cumming et al. 2005; Andersson 2006).

Social capital refers to the quality and quantity of a society's social interactions that are shaped by institutions, relationships, and societal norms. On the basis of trust, norms, and networks, according to Putnam (1993: 167), collaborative action can be facilitated, which will not only result in better economic performance but

also in the creation of civic infrastructure (Warner 2001). Thus, process of *social capital building*, (e.g. access to information and communication networks in times of difficulty), can help the recovery from socioeconomic or environmental change (see Chap. 10). Moreover, capital building supports formal and informal processes of decision making and public involvement (Warner 2001; Potapchuck et al. 1997), which can increase the capacity for social interaction and enhance the capacity of society to deal with adversities through the sharing of information when attempting to resolve conflicts and by building a more equitable society.

Adaptability is the ability of society in a social-ecological system to cope and respond to novel situations and change without losing options for the future (Folke et al. 2002). Thus, *adaptability* can increase the rapidity of recovery (see Chaps. 9, 11–13). Carpenter et al. (2001) explain this as the ability of systems to self-organise, learn, and adapt. The "adaptive capacity" of governance regimes at a local and regional level is analysed in Chaps. 12 and 13. An adaptive governance system can be achieved by equipping actors to deal effectively with sudden shocks, surprises, and risks in such a way that after the disaster, the system can return to its original function and structure (Baud and Hordijk 2009). An adaptive system should be *robust* and *flexible*.

Robustness refers to "the ability to withstand a given level of stress without suffering degradation or loss of function" (MCEER 2005: 19; McDaniels et al. 2008: 312) while *flexibility* is the ability or capacity that an organisation possesses to change or react (Golden and Powell 2000). The capacity of an ecological system or material to withstand an impact load without being permanently deformed also depends on its *flexibility* (i.e. its ability to bounce back). Gunderson (1999) argues that the adaptive management of a system during and after unexpected events depends on the flexibility among the stakeholders in the social system. A lack of flexibility in the management bureaucracy, according to Gunderson (1999), challenges the adaptive policy implementation process. As with the concept of resilience, both adaptation and mitigation are relatively new arrivals to the urban planning agenda, although these issues did not appear simultaneously. While mitigation has featured in planning for the last two decades (not always explicitly), adaptation has only appeared recently and was closely followed by the concept of resilience. Mitigation can primarily increase the robustness of the system, while adaptation can increase the rapidity of recovery.

Transformability refers to "the capacity to learn and create a fundamentally new and different socio-ecological system, one that hopefully would possess the attributes of adaptability and resilience" (Hudson 2010). It is the capacity to create a new system when ecological, economic, political, or social conditions make the existing system untenable (Walker et al. 2004). Learning capacity is an important attribute for the transformation of a system without damaging or jeopardising its effective functioning. Hudson (2010) calls this a process of social learning, through the use of human capacities and knowledge to reduce vulnerability and risk in the face of the unknown and unexpected. Thus, systems with a high social learning capacity will be more innovative, less vulnerable, and resilient (see Chap. 12).

3.4   Concluding Remarks: Towards Urban Resilience

This chapter has demonstrated that the concept of resilience has been influenced by its ecological research base and has been applied in socioeconomic studies such as environmental psychology, cultural anthropology, and human geography. In terms of empirical studies, the resilient approach is a concept for coping with new demands and uncertainties by "embracing changes". Urban resilience began to be addressed in spatial planning in the 1990s in the search for solutions of how functions under extreme stress in disasters could be maintained in resilient communities and later, resilient cities. Urban resilience studies today emphasise the adaptive ability of governance and considers not only the vertical linkages in existing planning systems but also the need to strengthen the horizontal networks in order to formalise cities to mitigate and adapt to increasing changes (Baud and Hordijk 2009).

Resilience is important in cities for two reasons: (1) it accommodates change without catastrophic failure; and (2) it allows people to adapt and live in places without exposure to uncommon stresses. The theoretical debate of resilience has been developed over four decades, while studies of urban resilience in spatial planning have started more recently. Planning today is still looking for strategies to strengthen physical and social networks, to not only mitigate but also to be able to adapt with flexibility.

The general concept of resilience and the more specific concept of urban resilience are both becoming increasingly prevalent in academic and policy discourses. This reflects an increasing sense of complexity, uncertainty, and insecurity about cities and a desire to identify strategies and new attitudes in planning. Definitions and interpretations of resilience vary, and the concept needs to be clearly addressed with the help of case studies from different cities. It is also becoming increasingly prevalent in urban policy documents across the globe. However, as discussed throughout this book, there is no single optimal state or definitive blueprint for urban resilience, as the structure or form of a resilient city is a function of its particular evolutionary path and its own *capacity for adaptation*.

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Chapter 4
Urban Resilience and Spatial Dynamics

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4.1 Introduction

Cities, as complex systems, present different urban patterns and spatial dynamics with diverse and multiple characteristics. Urban systems change and reorganise according to the diverse outcomes of economic globalisation, based primarily on population data, but with secondary reference to trends in economic growth and restructuring, and to the various roles played by governments in shaping the urbanisation process (Bourne 1995). Thus, economic growth and restructuring resulting from globalisation creates certain population dynamics and mobility patterns that influence the reorganisation of urban spaces (drivers of the economic globalisation are discussed in detail in Chap. 5 for the case study areas introduced in this book). The reorganisation of urban space, which is strongly influenced by the adaptation strategies of cities to global processes and endogenous capacities, takes various forms. This chapter intends to explore these spatial forms and dynamics and their implications on the resilience of cities. It is argued in Chap. 1 that certain spatial patterns may provide capacity to the system to absorb disturbances and reorganise itself. In this chapter, in order to understand the extent of the spatial dynamics to address social and spatial challenges, both the inner city and peri-urbanised areas, first of all, these spatial dynamics are identified, and secondly, their relation to the attributes of resilience is clarified. In this respect this chapter aims to provide an umbrella conceptual framework for the relationship between spatial change and resilience.

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Urban ecosystems evolve through multiple and diverse processes based on the dynamic interaction of human and the ecological ecosystems. Social and environmental systems are, inevitably, highly complex (Berkes 2007), and this complexity is characterised by nonlinearity, which means multiple possible outcomes of dynamics (Alberti and Marzluff 2004). The development of the urban system into different states over time is a rather complex and nonlinear one, depending on the agents, actors and forces at work. Research has revealed that it may be quite difficult, if not impossible, to study the whole system in one coherent model. The solution has been to change urban development from being a process that initiates a decline in ecosystem services and an increase in human services (Alberti and Marzluff 2004). The study of urban and metropolitan areas as urban ecosystems is a relatively new and promising field (Pickett et al. 1997). According to Pickett et al. (1997), there are two main reasons: first, urban areas are responsible for a considerable number of disturbances, stresses and changes in ecological systems, and second, the spread of urbanisation and its implications forced huge extensions of land-use conversion. Understanding the linkage between the two types of systems, ecological and human/social, can prevent future problems and help in understanding their functioning and interactions. Thus, urbanisation processes imply that knowledge about previous ecological systems must also integrate knowledge about the functioning of human systems on those territories.

Besides complexity, urban systems are intrinsically associated to other concepts, such as diversity and interconnection and interdependence. Diversity refers to the different functions performed within the system and the variety of groups that exist in that same system (Folke et al. 2002). Multiple components reinforce and protect the system against disturbances and external forces, and diversity facilitates redevelopment when the system is confronted with sudden changes or even disturbances, and is often used as a synonym of innovation. In this sense, urban patterns with multiple and diverse functions in multiple nodes/centres tend to be less vulnerable. Furthermore, the interconnections and interdependences between the different components, involving the exchange of knowledge, combining different ways of knowing and learning, facilitate support between the parts and contribute to a strengthening of the system. A stronger and more coherent system, in social as well as in physical terms, is more able to deal with external forces and threats. Collaboration among the different stakeholders involved in the urban development process also plays an important role as integrated and flexible approaches foster both opportunities and incentives. These attributes will enhance the system, making it able to deal with more or less disturbing uncertainties and to adapt to urban development forces. Thus, adaptability is also an essential quality of a resilient system, that is, adaptive systems tend to be more resilient (Folke et al. 2002). The learning process of adaptation to other states in the development process and a deeper knowledge of the behaviour of the components of the system promote the capacity for self-organisation (capacity to organise themselves in the event of change), which also leads to resilience.

In studying the relationship between resilience and urban land use/patterns, it is possible to identify two perspectives. The first essentially analyses the linkage between resilience and socio-ecological ecosystems, focusing on the integration of

the human and ecological functions (Alberti and Marzluff 2004; Berkes 2007; Holling and Gunderson 2002). From this perspective, the main concern is the study of the most resilient patterns to cope with natural disasters, risks and hazards and vulnerable areas. This is an increasingly important field of research that is integrated into wider research initiatives that encourage the incorporation of human and natural components of ecosystems, landscapes and regions (Pickett et al. 1997).

Another perspective, although still emerging, focuses on the linkage between resilience and spatial planning, identifying how planning can create more resilient cities. Godschalk (2003), for example, identified a set of characteristics (or principles) of resilient systems that can be applied to physical and social systems to create more resilient cities. Besides some of the attributes already mentioned (diversity, strength, interdependence, adaptability and collaboration), he adds three more: redundancy (systems designed with multiple nodes to ensure that failure of one component does not cause the entire system to fail), efficiency (positive ratio of energy supplied to energy delivered by a dynamic system) and autonomy (capability to operate independently of outside control). Our approach follows closely this last perspective.

Drivers of change cause diverse transformations in peri-urbanised areas, mostly related to the expansion of the urban population and economic activities towards the periphery of cities, where population, activities and functions emerge in diverse forms (including sprawl, suburbanisation, leapfrog development, fringe development, spatial fragmentation, rurbanisation[1] and polycentric development). However, when cities expand towards the periphery in one (or a combination of several) of these forms, the inner city areas also face certain challenges. In some cities, residents and activities have moved out of the central urban areas. Following the decline of inner city neighbourhoods, these functions are replaced with new ones (or new residents), resulting in the redevelopment, regeneration or gentrification of these areas. If it is a successful process, the inner city in particular and central urban areas in general begin to be intensified with new functions and residents. However, in some cases, inner city areas cannot be able to attract new functions and residents, becoming vacant and entering a period of decline in terms of population and business.

Keeping the different spatial dynamics in mind, this chapter focuses on two forms of spatial redistribution of population and economic activities, namely, urban sprawl and polycentrism, and two forms of inner city transformation, namely, shrinkage and compactness, as the most common processes in our case study areas. Urban sprawl had been on the agenda of the urban growth literature for more than a half century; polycentric development, being a relatively new phenomenon, introduced in order to designate a new type of urban sprawl that can also enhance the competitiveness of cities and city regions; shrinkage, as a new spatial dynamic resulting from a loss of attractivity in the inner cities, which is also accelerated by the new policies that favour peripheral development; and lastly, the compactness of

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[1] Rurbanisation refers to the process of spatial transformation in rural areas at the immediate periphery of cities caused by economic, demographic and social transformations from rural functions towards more urban activities in previously rural areas.

built-up areas, accelerated by both the increasing demand of the global core functions and policies designed to create more compact cities. These should not be understood as single or deterministic models that have occurred in a particular city, but should rather be used as conceptual devices to support the different visions and strategies of policy makers. More than one type of spatial dynamic may be prevalent in any city, which means that a city may have shrinkage and sprawl at the same time in different sections of the city (such as Lisbon and Oporto), compactness and sprawl (such as Istanbul) or a city may experience both polycentric peripheral development and intensification in the inner core (such as Stockholm and Rotterdam).

4.2   Spatial Dynamics of Urban Change

Urban change is a continuous process that is driven by several dynamics (social, economic, cultural, institutional, spatial and political). There is a three-way relationship between urban change, urban development dynamics and urban policies. Urban policies are a response to urban change and are aimed at improving or redirecting the outcomes of the process of change. However, they are also strongly influenced by the characteristics of spatial dynamics and under what conditions they have been stimulated. Although they are contingent to individual cases, they can still be evaluated in terms of their ability to generate resilient urban areas. This is especially important, since the built environment and infrastructure cannot be changed rapidly.

Urban policies have a direct influence on urban change, but the diverse characteristics of urban dynamics may also influence the development of new urban policies. The same cyclic relationship also occurs between urban growth dynamics and urban policies. Policies (not only concerning spatial organisation and planning but also social, ecologic and economic policies concerning the well-being of urban citizens and the sustainability of urban development) reflect certain economic, demographic and spatial growth dynamics in cities, while also being shaped by them. The more this three-way relationship is in balance in providing economic development and competitiveness and nourishing the social and ecological balances, the more sustainable the urban policy becomes.

4.2.1   Urban Sprawl

Although urban sprawl has been attracting substantial attention for over 40 years, there is no consensus on the definition. That said, it is usually portrayed as inefficient, being a resource wasteful land-use pattern that takes in almost every possible development with negative impacts, and is judgementally compared against the compact city ideal. Sprawl is described as decentralisation with lower densities (Glaeser and Kahn 2003; Galster et al. 2001) and is defined as the excessive spatial growth of cities relative to what is socially desirable (Brueckner 2001), with an assertion that

jobs and development follow population to the fringe, and that businesses always pursues lower development costs and greater access to highways (Torrens 2008). It has also been described as low-density, discontinuous, suburban-style development, often characterised as being the result of rapid, unplanned and/or uncoordinated growth (Carruthers and Ulfarsson 2003).

Early literature on sprawl, which is mainly dominated by the US experience, emphasises that suburbanisation occurs due to changes in transportation technologies and the consequent rapid increase in car ownership, enabling people, seeking for a new way of life, to move to the periphery of major cities. From the 1980s onwards, while new activities began to relocate to peripheral areas, the character of urban sprawl somewhat changed, and the spread of the working areas and central city functions, followed by the new residential areas, created new nodes far from the densely populated core cities the so-called edge cities. The negative impacts of sprawl on environmental resources begin to emerge, causing air pollution as well as inefficiencies in the provision of public infrastructures and services and other social activities. From the 1990s onwards, emphasis has been on urban decline as a result of central city functions moving towards the periphery. Urban regeneration and renewal emerged in reaction to the negative consequences of sprawl, and the creation of more compact cities became the central objective of the new urban policies. However, as Bae and Richardson (2004) argue, the existing policies still fall far short of being able to change the dominant tendencies and make people return to the city centres, at least in the US context.

There appears to be broad consensus among planning and urban scholars that sprawl is a large and complex, not easily remedied, problem that is responsible for a number of negative consequences (Howell-Moroney 2008). Most theoretical discussions and empirical studies on sprawl concentrate on its *costs* (for a synthesis, see Ewing 1997). Ewing (1997) notes that no single archetype provides a complete definition, as all include several features large areas of low-density or single use, strip, scattered and leapfrog development. Couch et al. (2005) highlight that sprawl exhibits low levels of the following eight dimensions: density, continuity, concentration, clustering, centrality, nuclearity, mixed use and proximity (for key features, see Torrens 2008).

While the negative aspects of sprawl dominate most debates, alternative urban growth processes and patterns with less negative impacts are presented under the headings of sustainable development, smart growth, slow growth, etc. Smart growth, as both a concept and a movement, emphasises the limitation of horizontal expansion; costly sprawl; promotion of denser and mixed-use development; increases in pedestrian accessibility, thus reducing car usage; and preservation of agricultural lands and ecosystems, to name just some of its core principles and issues.

Angel et al. (2005) argue that some of the claims regarding the negative impacts of sprawl should be disputed, giving actual examples. There are even claims that low-density sprawl may lead to more efficient and rapid economic development, to more rapid job creation, to more affordable and larger housing and lower levels of shelter deprivation, to higher rates of home ownership, to cheaper and better public services, to satisfactory levels of social interaction and to a better and higher quality

of life. Arguments in favour of sprawl receive less support; however, there are important debates indicating that externalities are contingent to the characteristics of the city (Glaeser and Kahn 2001; Gordon and Richardson 1997a), such as specialisation and city form.

To what extent may sprawled cities have capacity to absorb disturbances and reorganise themselves in the event of a disaster? Literature is divided on whether sprawl can actually be defined as a resilient urban pattern or not. Looking a little closer at the attributes of resilience and the characteristics of sprawl, it is possible to find interconnections. Low density and/or dispersed sprawl, besides for civil defence in case of attack, may be useful in the event of natural or environmental hazards, generally allowing more room for manoeuvre in any given situation, corresponding to adaptability and strength. The same applies to the decentralisation and polycentricity characteristics of sprawl, which can also be seen as contributing to redundancy and autonomy, ensuring that the failure of one node or area does not cause the entire urban system to fail, and the ability to operate independently of outside control. Sprawl may allow for more integration between ecological and human systems below the capacity thresholds of ecosystems. Interdependence and collaboration depend more on the available support instruments than on the spatial dynamics at hand. Even the so-called inefficiency of sprawl can to some extent be disputed (Angel et al. 2005; Gordon and Richardson 1997a).

4.2.2   Polycentric Development

The term *polycentric* denotes that a spatial entity consists of multiple centres, regardless of what kind of centres are in the focus, or what type of relations they maintain. The concept of polycentric development entails, at least, four dimensions, which should be carefully distinguished. Firstly, it can be either understood as an analytical-descriptive tool to describe the current state of a spatial entity or, secondly, as a normative concept which should help, for instance, to reorganise the spatial configuration of such an entity. Thirdly, when talking about spatial entities, one needs to clarify their spatial scope, being, in our case, the city and city region levels. Lastly, on closer inspection, the concept challenges our understanding of centres within, for example, a city region, as it can be related to either their functions/roles, and thus their functional tie, or their specific physical forms. One can argue, in line with Davoudi (2003), that polycentricity means different things to different people, as how it is perceived is by its very nature extremely fuzzy, given its many dimensions and perspectives. When discussing the concept, it is thus almost impossible to clarify each time what dimension of human activity is in one's mind and in what specific context it is being referred to, adding to the many uncertainties and connotations that are related to the concept of polycentricity.

Regarding the city and city region spatial scales, different lines of research have been followed in the literature. Some authors (Ipenburg and Lambregts 2001; Meijers and Romein 2003) focus on polycentricity's relevance, perception,

potential application/feasibility and policy design, applied to a number of selected regions. Meijers and Romein (2003), Knapp et al. (2004) and Gabi et al. (2006), on the other hand, specifically address the issue of institutional capacity building and governance in such city regions, while Batten (1995), Capello (2000) and Meijers (2007) focus on the role and function of centres, their potentials for networking, discussions about external economies and whether several centres within a city region can complement each other. Hall and Pain (2006) or Green (2007) focuses on the discussion on how to measure – or just anticipate – flows within polycentric urban configurations in an attempt to say something about their real interactions. Finally, the morphologic dimension of polycentricity is studied by Champion (2001) and Mela (2008), referring to the debate on the concrete shape of the urban fabric, which is a kind of precondition for the more functional and relational aspects. It is this final approach that is more in line with this book's perspective.

Polycentricity integrates a broad range of concepts with consensual points, some with a long tradition, in the debates on the megalopolis; on the "urban field"; on the regional city; on the garden city; in recent years, on edge cities; on the *Zwischenstadt*; on the network city; or even on (global) city networks. There is an enormous body of literature in which these and other related concepts of how cities and city regions develop can be found (for more, see Lahti 2004).

Champion (2001) explains the emergence of *polycentric urban configurations* as being a result of the changing demographic regimes that have occurred over the past 40 years with regard to attitudes, lifestyles, immigration to urban regions and the composition of the urban population. Based on such dynamics and the concrete morphological starting point, he derives three different development paths for such emerging polycentric urban configurations: (1) the *centrifugal mode*, (2) the *incorporation mode* and (3) the *fusion mode*. His typology of evolutionary modes thus draws attention to the fact that today's polycentric urban regions have developed from different morphological points of departure (Lambregts 2006).

In recent years, the influence of Europe's urban system on its economic competitiveness, as well as the potential to ensure a balanced development of the European territory, has been extensively dealt with in both the academic and political realms. Key documents include the European Spatial Development Perspective (European Commission 1999) and the so-called European Territorial Agenda, adopted in May 2007. Nowadays, the understanding of polycentricity has been extended to notions such as territorial cooperation, urban networking and territorial cohesion. Apparently, polycentricity is seen as a bridging concept that is used to overcome tensions between potentially contradictory policy objectives of the EU, namely, competitiveness and cohesion (Schön 2005).

To what extent may polycentric urban regions have capacity to absorb disturbances and reorganise themselves in the event of a disaster? In order to asses these attributes of resilience need to be observed in smaller scale typologies of polycentric development, such as redundancy, diversity, critical mass, complexity, flexibility and adaptability, all of which can be associated with polycentrism, although they depend on the local polycentric system.

Meijers and Romein (2003) refer to diversity and redundancy attributes, noticing that polycentric urban regions may entail certain competitive potentialities by relating to the pooling of resources, complementarities and spatial diversity. Several European countries are aware of these potentialities, often building on increasing functional relationships between their polycentric regional systems. Meijers (2007: 98) relates these two attributes with critical mass when proposing three potentialities of regional coordination and action in polycentric urban regions: (1) pooling resources in order to share facilities and services and to achieve "critical mass" (2) developing and exploiting balanced complementarities and (3) optimising spatial diversity by improving the quality of open spaces.

Complexity is a resilience attribute that is also referred to in literature. Albrechts (2001) points out that polycentric city regions should be considered as open and multilayered complexes of nodes, networks, flows and interactions at global, regional and local scales. Meijers (2005) agrees, suggesting that these patterns are often associated with the notion of synergy and explaining that the individual cities in these collections of distinct but closely located cities relate to each other in a synergetic way, making the whole networks of cities more than just the sum of their parts.

Adaptability and flexibility could also be referred to as resilience attributes of polycentrism. Once in a system of several multifunctional nodes, each one might be less dependent from the system as a whole, having capacities to balance its activities when affected by a disturbance. Again, in practice the specific characteristics of each case should be considered, as polycentric systems might include more specialised nodes that could have minor influences on an evaluation of flexibility and adaptability.

4.2.3 Shrinkage

The shrinking city concept is a relatively recent arrival to the urban planning debate. As one would expect, there are differences of opinion on what the concept actually means on a global scale. The causes and characteristics of shrinkage are as prevalent as the cases (Rieniets et al. 2006), however shrinkage, in its most broad and common sense, means long-term population loss. All seem to acknowledge this demographic characteristic, but the richness of the concept goes way beyond that. Twenty-first century shrinkage is a global, structural and multidimensional phenomenon that is concomitant with a visibly declining population, possibly combined with a declining economy and national or international importance, affecting different territories and scales that may or may not have started to spatially shrink (Sousa 2010).

In spatial terms, it manifests itself through doughnut patterns (in the centre) or its reverse (in the suburbs), or in mosaic or perforation patterns (mixed type) in sprawling, compact or polycentric areas. In other words, shrinkage might not be homogenous, as some parts can grow slightly, while the majority stagnate or decline. Shrinkage is usually accompanied by a projection of an image of decline and of a potential loss of the traditional notion of urbanity. From a wider urban and regional planning perspective, it signifies (or should signify) a paradigm change to planning for shrinkage or planning for stagnation.

Over the last three centuries, as urban growth became the final goal for most regions and cities and, apparently, the only way forwards for development, growth has come to dominate the international debate. In the meantime, shrinkage has been neglected by decision makers and planners, as if it were a dysfunction in development cycle. Shrinkage is not a passing phase of urban development but a part of this development that has been uncared for, treated either as a taboo (Oswalt and Rieniets 2006) or at minimum a pathology (Leo and Brown 2000). Nevertheless, decline is not a recent phenomenon, as it has always been an aspect of urban settlement that is as foreseeable as growth.

Theoretical discussions on the topic of shrinking cities have focused on what defines shrinkage in a specific context, while there are also a number of attempts to put forwards typologies of shrinking cities. The relation between planning and shrinkage, on how planning is coping, innovating and renewing itself, has also been a subject of discussion (Jessen 2006). Urban regeneration efforts and debates focus on the most visible aspect of spatial shrinkage – that of housing vacancies and vacant lots, alongside assessments of the roles of culture and creativity, knowledge, innovation, ICT, etc. (for a review, see Sousa 2010). Moreover, some authors have also developed psychological perspectives of the phenomenon (Borries and Böttger 2004; Delken 2007).

Maintaining a strategy of economic growth with the objective of restarting population growth is the most frequent reaction to shrinkage, but efforts in this regard have seldom led to success (Pallagst 2008). Authors generally agree with Wiechmann's (2008) assertion that the challenge is to deal with the growth/shrinkage patchwork while accepting that the future remains uncertain and unpredictable and that it is a question of negotiating growth and decline rather than achieving equal growth (Tietjen 2007).

To what extent may shrinking cities have capacity to absorb disturbances and reorganise themselves in the event of a disaster? Specifically, shrinkage implies (or can imply) a relief in pressure for growth. It may allow for regions and local municipalities to catch up with the demands for new infrastructure and social services and to address the need for environmental sustainability, improving the performance of resilience attributes. Banzhaf et al. (2006) refer to this as counter development, being an opportunity to minimise the amount of further land consumption, to develop a different inner structure of a shrinking city and to redevelop urban areas of residential vacancy and urban brownfields, thus creating new open spaces or planning densification projects. This can be referred to as adaptability and/or improvement of efficiency and clearly promotes a better relation between the urbanised and ecological systems. Sinking population densities and the resulting vacant dwellings and derelict lands denote significant changes in circumstances and present opportunities for the deconstruction of created situations that would otherwise be unthinkable (Sousa and Pinho 2009). Diversity and collaboration may be increased through innovation and creativity in planning for shrinkage, which is a process that may also promote participation and capital building.

It should be noted, however, that shrinkage cannot be associated to a specific urban pattern of development, as it can occur simultaneously with sprawl, in compact

cities or together with polycentrism. For this reason, the debate about resilience and shrinkage should not be disassociated from other types of spatial dynamics.

4.2.4   Compactness

Compactness refers to the agglomeration of urban activities, functions and residents with the physical proximity and continuity of increasing density. It is taken to mean (1) a relatively high-density city at the neighbourhood, community, citywide or even metropolitan level and (2) a mixed-use city. The combination of proximity, continuity, density and mixed-use attributes is the basis for efficiency in, for example, (1) stimulating social interaction, (2) allowing for an efficient public transport system, (3) encouraging walking and cycling, and (4) justifying public facilities and public services. A concentration of urban functions leads to a compact spatial structure, emphasising a spatial pattern that is oriented towards the downtown or the central city instead of a polycentric (or dispersed) spatial pattern (Burton 2000).

The reviving interest in policies for compact urban form and intensification can be related to the search for global sustainability on climate change and resource use since the late 1980s. Two concerns are particularly important: first, environmental rationality in architecture, planning and urban design is fundamental, as there is now a much wider concern for the environmental and socio-economic consequences of energy production, and consumption associated to particular forms of urban development, while second is the recognition of a global rationale, as most of the environmental problems have global consequences (Burgess 2000). Although intensification appears to be a particular prescription of a compact urban form, it includes many other policy prescriptions for the attainment of a sustainably functioning urban system. Spatial models and strategies have been developed to change the urban structure so as to achieve the desired sustainability benefits (Burgess 2000), including such strategies as (1) high-rise and high-density development, (2) the creation of concentrated decentralisation in an attempt to shift from a monocentric to polycentric structure, (3) linear transit-oriented development models, and (4) traditional infill, densification and intensification strategies.

It should be noted that many scholars are sceptical about the benefits of compact cities. Gordon and Richardson (1997b) indicate that compact city policies are contrary to the market process that has produced the current urban settlement structures, claiming that (1) the expansion of urban areas has not caused any significant decrease in the stock of prime agricultural land in the United States; (2) low-density settlement is the overwhelming choice for residential living; (3) suburbanisation has been the dominant mechanism for reducing congestion and trip lengths, with some success; (4) downtown renewal efforts have failed (in the US context), wasting taxpayers' money and misallocating scarce public sector resources; and (5) the equity case for compact cities is weak. The equity effects of compactness have been investigated in UK cities by Burton (2000), who concluded that social equity has a limited

relationship with compactness and that social equity has to be broken down into its constituent elements to establish a meaningful relationship with compactness.

To what extent may compact cities have capacity to absorb disturbances and reorganise themselves in the event of a disaster? The attributes of resilience in *compact* cities can be contradictory and should be observed in smaller scale typologies, or even on a case-by-case basis. In a first approach, resilience attributes such as efficiency, diversity, complexity, connectivity or capital building may be associated with compact urban patterns.

Efficiency is commonly referred to as an attribute of the compact city, being associated with social proximity, less wasteful use of resources, more energy efficiency and better provision of public services. Even the more sceptical authors accept this, referring to the urban sprawl/compact dilemma. For example, Gordon and Richardson (1997b) recognise the reduced energy dependence of individual mobility, the possibility to have high-capacity transit systems and the reduced costs of infrastructures and public facilities.

In the conclusion to his overview of contemporary urban design, Sonne (2009) points out the diversity characteristics of intensification in a compact urban form: "The movement for block reform must therefore be considered as highly creative. This kind of research patience may even have involved more creativity than developing simple slabs as a result of sanitary demands according to supposed scientific methods" (Sonne 2009: 53).

Referring to the controversial relationship between *compactness* and the environment, De Roo (2000) emphasises complexity as a relevant attribute of the compact urban form and highly relevant for studies of the interrelations between environmental conflicts and their spatial dimension. Policies for compact cities/intensification face difficulties in solving environmental conflicts, in that they maintain a significant distance between intrusive sources and environmentally sensitive areas, functions and activities.

Connectivity can be conceived as a characteristic of compact cities due to physical proximity, although in practice it depends on the type of urban fabric. For example, conceptually, in a system with a tree pattern, the rupture of one connection can leave its subsidiary arms isolated, although in a matrix pattern the rupture of one connection can be supported by the entire system. Focusing on a specific case, in the Barcelona compact central area the connectivity of the medieval urban fabric cannot be compared to the Cerdá's "ensanche" urban fabric.

Capital building might also be associated with compactness due to the increased capacity for social interaction, although compact cities or smaller territories within them might present different dynamics and cycles over time.

4.3 Spatial Dynamics and Urban Resilience

The different spatial dynamics occurring in urban development can be related to the concept of urban resilience, as indicated above. There is evidence that certain attributes of resilience are related to particular urban patterns and dynamics, although the

context and local specificities may play an important role. It should also be noted that most analyses on sustainable land use are also valid for the concept of resilience; however, focus should be on the capacity to cope with disturbances, problems and adversities, introducing a new perspective on the traditional paradigm of sustainable development.

From the literature review, it can be seen that some urban patterns have been more associated with sustainable land-use patterns than others, such is the case of the compact city model. Compactness appears to go hand in hand with the goal of liveability and aims at reducing commuting. Efficiency is another important feature, referring not only to spatial organisation but also to the efficient involvement of the community, a balanced economy of the land development process and land-use policies that combine the reuse of land in already built-up areas with a restrained use of land around the cities. Aspects such as urban containment, density, diversity and efficiency are the primary principles in most references to sustainable land use, and these may also be associated with urban resilience. There are a number of aspects or principles that are usually enumerated concerning land use but also resources, energy, transportation and social issues like social justice or the creation of a sense of place and community.

Urban development creates and changes existing landscapes, affecting the capacity of urban ecosystems to sustain urban quality of life (Resilience Alliance 2007). There are two main factors to this: rapid changes that occur due to land-use transformations and the inevitable fragmentation of ecosystems as a result of urbanisation. Efforts towards sustainable land use aim to address both factors. Aiming at preventing spatial deconcentration in the form of urban sprawl, spatial fragmentation or leapfrog development, sustainable land use in the inner city means the recycling of land in existing urban areas through the use of brownfield sites for development and the efficient use of urban infrastructure, and in the periphery it refers to the way of creating sustainable patterns of transformation from rural to urban land by discouraging greenfield development and minimising the consumption of agricultural land, thus enhancing the opportunities for environmental protection, improving economic and social conditions and improving human health and safety in cities (Turvani and Tonin 2008) and consequently, increasing local resilience.

The strategy of infill development helps create more compact and vibrant communities through a diversity of mixed uses, well-connected street patterns and better provision of community services and facilities, rather than just increases in density. Thus, the recycling or reuse of vacant urban land became the primary means of sustainable urban land use in literature across the world (Greenstein and Sungu-Eryilmaz 2004; Bowman and Pagano 2004; Brachman 2004). This type of urban development has also been associated with the shrinking cities phenomenon, transforming and adapting residential areas for other uses.

High-density mixed-use areas can supposedly contribute to profitability and economic growth, lower energy consumption and greater distributive efficiency (Jones and MacDonald 2004); however, some authors (Scoffham and Vale 1996) point out that what matters more than the degree of density is the spatial organisation of residential functions to provide long-term flexibility and adaptability – both of which

are attributes of resilience. The long-term consequences of higher density development in the inner city areas to the sustainable use of urban resources are not yet known, as is the case for methods of how to measure density more appropriately, how to intensify the utilisation of urban areas acceptably and how to determine the limits of capacity of urban areas (Scoffham and Vale 1996).

The debate on sustainable land use has highlighted several environmental issues (supporting nature conservation, biodiversity and climate change, mitigation and adaptation) without specifically or explicitly looking for the complex web of linkages between the social, human and ecological systems. The resilience approach, instead of focusing on the resources consumed by cities, deeper analyses the interdependencies along the chain of supply and demand (Montenegro 2010). This approach has been emerging more recently in the field of ecology. It is recognised that urban development affects the patch structure by changing the size, shape, interconnectivity and composition of natural patches (Alberti 2005), and this change occurs in a physical dimension, and so alternative urban patterns have different ecological consequences. These consequences are a result of transformations in land cover, the availability of nutrients and water and increases in impervious land area. Also, urbanised areas generate microclimate and air quality changes, such as is the case of the urban heat island.

Resilience theory, by considering urban systems as complex adaptive systems, introduces a new vision into the analysis of the urban structure of cities. Efficiency, for example, is a key issue that might have distinct perspectives in sustainability and resilience. Increasing efficiency is usually associated with an optimisation of the functioning of systems; however, eliminating redundancies so as to achieve more efficiency may lead to more vulnerable conditions when changes occur. Redundancy, combined with diversity and modularity, enhances the resilience of a system (Barnett, in Montenegro 2010). This may be the case more in polycentric patterns than compact and monocentric patterns.

Elmqvist (in Montenegro 2010) argues that social equity and access to resources are important components of resilience from a human dimension. Social equity and cohesion contribute to capital building and enhance the capacity of society to deal with adversities through the sharing of information in the resolution of conflicts and by building a more equitable society.

Urban resilience highlights, in particular, the importance of ecosystem services within cities. Understanding the different functions of the ecological systems in an urban area will allow a reduction of vulnerability in that area. Green and blue structures perform important functions and are affected by patterns of urban development. According to Alberti (2005), however, determining the desirable characteristics of urban development patterns requires further research. Thus, it is difficult to define the most adequate degree of compactness, density, connectivity and heterogeneity, and moreover, there is evidence that the supporting ecological systems react differently in different contexts and scales.

4.4 Conclusions

Although most attributes of resilience have been inherited from the sustainability debate, some new features should be considered, and some may have different interpretations and assumptions. The main paradigm shift from sustainability to resilience lies in the consideration of urban areas as complex adaptive systems. Furthermore, studying urban systems means bringing the linkage between ecology and planning into the spotlight and an investigation of the most adequate spatial patterns or forms for dealing with adversities. However, one should bear in mind that the complexity and variety in urban systems means that there are different stages of equilibrium, as what constitutes the best type of urban development or the best response to sudden environmental changes may evolve over time. A combination of multiple types of patterns may be the most appropriate form for the integration of urban and ecological systems. It is important that particular urban transformations should be taken advantage of to enhance the attributes of resilience.

Thus, there seems to be a relationship between the spatial processes of urban transformation and resilience. Certain patterns may be better able to cope with disturbances occurring in urban areas, to better adapt to change and/or to better promote self-organisation. While there are many uncertainties about the urban future, certain decisions may be more resilient than others may. A key challenge is to identify the decisions that appear to be most resilient across a range of possible futures through the identification of land-use policies that promote resilience.

Policies for sustainable development, assuming that we must prepare and adapt our current development options, have often neglected the unpredictability and uncertainty of future development. Moreover, the three pillars of sustainability – environmental, social and economic – should be understood in an integrated way, as policies will interfere on social-ecological systems, characterised by complex interconnections between their assets. Understanding uncertainty is a crucial condition to reduce vulnerability and cope with changes occurring quickly and unexpectedly. Nowadays, development challenges are increasingly evolving and demanding, and strategies must be prepared for adapting to uncertainty, in contrast to more traditional oriented-driven management. An imminent threat may be caused by the increasing rhythm of events and rapid changes – planning may become reactive by adapting to those sudden changes. However, resilience embraces the anticipative dimension, by dealing with the unexpected through a learning process, which means planning should prepare, plan and anticipate how quickly future moves.

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Chapter 5
Analysing the Socio-Spatial Vulnerability to Drivers of Globalisation in Lisbon, Oporto, Istanbul, Stockholm and Rotterdam

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5.1 Introduction[1]

The spatial development of cities is influenced by a combination of economic, social, demographic and environmental factors, which cause certain vulnerabilities in cities. Vulnerability, in this respect, means "exposure to risk and an inability to avoid or absorb potential harm" (Pelling 2003). Thus, *socio-spatial vulnerability* can be defined as the openness of regions, territories, cities, parts of cities, urban-built environments, urban areas, neighbourhoods or places to the risks caused by diverse dynamics, events and impacts. These disturbances can be unexpected or expected, sudden shocks or slowly developing changes and can have different drivers (economic, social, political or ecological). Vulnerability refers to the limited capacity of *spaces* to avoid or absorb potential harm from diverse risks and includes complex socio-political characteristics attached to the spaces that accommodate them. This means that physical capacities as well as social processes attached to these spatial processes need to be addressed here. Socio-spatial vulnerabilities are defined not only in terms of path-dependent characteristics of space but also their exposure to major pressure/damaging phenomena and economic pressure, particularly in periods of change in economic and political regimes, while also discussing modes of regulation.

In this chapter, it is claimed that the vulnerability of cities has increased substantially over recent decades due to changes in the economic regime, specifically from a Keynesian developmentalist model to a neoliberal approach. There is no

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doubt that globalisation has brought about important changes in cities, and sometimes even contradicting, spatial manifestations have taken place in cities in response to global challenges. Global challenges have had important implications for transformations in cities, including economic restructuring, the spatial redistribution of the population and economic activities, and new divisions in the labour market.

Consequently, economic restructuring can be considered as one of the main sources of vulnerability. Previous literature has pointed out that the different forms of transformation are induced by the *redistribution of the population and economic activities* in urban areas. Cities go through some spatial and functional transformations (as described in Chap. 4) that are accelerated by the changing priorities in urban activities, while also facing spatial, social and economic inequalities and *socio-spatial segregation* due to labour processes that result in certain groups being favoured over others.

Socio-spatial segregation can be defined as spatialised social and economic inequality (in terms of access to housing, quality of space and locational advantage) among groups living under different social (employment and education) and economic (income and property ownership) conditions (Taşan-Kok 2012). *Socio-economic segregation* processes, like redistribution processes, are triggered by changing economic, social and political conditions, though in different forms depending on the path-dependent conjunctures in diverse countries.

The argument put forward is that *spatial and functional transformations* and the consequent redistribution of population and activities leading to *socio-spatial segregation* processes increase the vulnerability of cities. It is claimed that the interconnections and interdependences between the different social groups facilitate support between the different segments of society and strengthen the urban system and its resilience. Accordingly, increasing *socio-spatial discontinuities and a loss of the medium of collective action* are major sources of vulnerability in cities.

Social continuity plays an important role in the capacity of the system to cope with uncertainties, as it helps communities to communicate and organise themselves easily. Segregated communities have less chance to cooperate and coordinate actions when needed. Socio-spatial segregation also limits the democratic participation of diverse groups in common actions and negatively affects the learning process of adaptation to unexpected or expected conditions in the development process, which are extremely important for the capacity for self-organisation and resilience.

This chapter focusses on the urban growth dynamics and the drivers of spatial change experienced in four countries (Portugal, Turkey, Sweden and the Netherlands) and five major cities of these countries (Lisbon, Oporto, Istanbul, Stockholm and Rotterdam). It considers both the path-dependent characteristics and contextual dynamics of different periods. The aim is to define how recent changes have affected socio-spatial vulnerability in the case study cities. In the first section of this chapter, socio-spatial transformations in the global drivers of change are addressed briefly in selected case cities, while the second part of this chapter is devoted to defining the socio-spatial segregation processes in each.

5.2 Determinants of Change: Neoliberal Economic Restructuring and Socio-Demographic Transformations in the Case Study Areas

Most countries experienced changes in their economic regimes in the 1970s under the conditions imposed by globalisation, mainly in the transition from the Keynesian to neoliberal model of development (see Table 5.1). The economic restructuring that took place to adapt to the global economic dynamics gave rise to new opportunities and constraints in different sectors, with some important implications for production systems and labour markets (see Chap. 2). In some cases, economic restructuring was triggered by globalisation, while deregulatory measures were also supported by changes in political regimes (in the case of Portugal in 1970s and Turkey in 1980). In any case, economic restructuring processes, driven by the new neoliberal agenda, were obviously driven by the path-dependent trajectories of events and the institutional context of each country (Table 5.1).

In all four countries, it is possible to identify a variegated form of welfare state economic regime that dominated the policies and regulation regimes prior to the 1970s crisis, which has shifted to neoliberalism with the help of deregulatory measures. These key transformations and trends in our study areas, such as increasing *privatisation* (Sweden and the Netherlands), *deregulation* (Turkey) and increasing *entrepreneurialism* (Portugal), make up the different components of the neoliberalist economic and state restructuring. Moreover, there are two common tendencies that are important in these countries: the first is the restructuring of the cities, which causes the decline of certain activities, but growth on localised international functions and services, while the second is the ascent of the property market in the urban economy.

The restructuring and deindustrialisation processes and the growth in services brought about a change in sectoral priorities, employment opportunities and labour market dynamics, along with functions related to the internationalising service economy, which triggered socio-spatial transformations. Previous literature has illustrated the implications of restructuring the economic basis of cities during the shift from Keynesian welfare state policies to post-Keynesian neoliberal policies, emphasising the decreasing social cohesion and increasing socio-spatial segmentation (Fainstein 2001a, b). These tendencies are accelerated by the massive population movements, both within the countries and from abroad. As can be seen from Table 5.2, there are other demographic factors that have played an important role in the segregation processes in the case study areas. In order to understand the important socio-spatial transformations taking place in these countries, there is, however, a need for an evolutionary analysis.

In Portugal, the major spatial transformations go back to the 1960s, when migration flows gave rise to both a dense urbanisation along the Atlantic coastline and the desertification of inner areas following a strong rural exodus and a lack of suitable housing policies. Around the same time, outward emigration to other parts of Europe and the United States was high. The exceptional population growth in the most important cities and inefficacy of planning tools and policies led to

Table 5.1 Impact of economic restructuring in different periods in the case study areas

	Portugal	Turkey	Sweden	The Netherlands
Keynesian (1950s and 1960s)	Development via industrialisation, economic investment and infrastructure development	Modernism-managerialism with limited resources	Social democratic model of welfare society with economic reconstruction and growth	Generous welfare state economy
Transition (1970s and 1980s)	Economic crisis, decolonisation and emigration	From protectionist economic policies to increased reliance on market forces	Deregulation and decreasing welfare services	Transition of welfare state economy towards liberalism
Post-Keynesian (1990s and 2000s)	EU integration and increasing entrepreneurialism	State-assisted competitive entrepreneurialism and deregulation	Challenges to maintain the welfare system privatisation	Devolution and deregulation, besides privatisation

Table 5.2 Dominant urban growth dynamics in four countries in different periods

	Portugal	Turkey	Sweden	The Netherlands
Keynesian period (1950s and 1960s)	Urbanisation along the Atlantic coastline and important cities and the desertification of inner areas	Massive migration from rural to urban areas Increasing growth of metropolitan areas	Urban growth accelerated by investments in large-scale projects	Decentralisation, suburbanisation and sprawl Development of new towns
Transition period (1970s and 1980s)	Functional dispersion of urban fabric Discontinuities in suburban and peri-urban areas	Neoliberal forms of urban development, increasing importance of property markets	Market-oriented development Market-oriented supply Construction of apartments of higher quality and price	Increasing problems in the inner-city urban areas Urban densification, brownfield development and controlled urban sprawl
Post-Keynesian period (1990s and 2000s)	Loss of population in metropolitan centres; shrinkage Increasing migrations between municipalities	Increasing importance of export centres, coastal areas and metropolitan areas. Increasing primacy of Istanbul	Both urban sprawl and densification	Mixed growth tendencies: decentralisation and inner-city regeneration Large-scale inner-city regeneration projects, besides new town development out of cities

large-scale suburban development. Driven by dense suburban housing, illegal urbanisation and slums with few urban facilities (health, educational, cultural) and commuting to industrial areas or traditional city cores (PNPOT 2007; Silva 1994), cities sprawled independently of spatial planning laws during the 1960s. Democracy in 1974 marked a clear shift from the former totalitarian regime. Among other factors, this change brought colonial independence and, as a consequence, a difficult decolonisation process. This course of action, together with the international economic crisis, brought a large number of returnees and foreigners to Portugal. Although some returned to their home towns in inner rural areas, most concentrated in the metropolitan areas of Lisbon and Oporto where jobs in industries and services were available. In this period, although the potentials of medium-sized cities were recognised, functional dispersion and urban fabric discontinuities continued in suburban and peri-urban areas (PNPOT 2007). Following accession to the European Community (and European funds) in 1995, substantial sums of money were invested in the development of road networks, especially motorways, and other urban infrastructure. The development of the transport infrastructure network contributed to a functional polycentric shift, which would complement the earlier residential suburbanisation areas. This largely allowed not only a population stabilisation in the Portuguese metropolitan areas but also an increase in the number of inner migrations between municipalities. It also promoted a loss of population in metropolitan centres, such as in the cities of Lisbon and Oporto, and resulted in important shrinkage dynamics, which would become critical issues in urban design and planning.

In Turkey, large metropolitan areas also faced massive immigration from the surrounding regions, beginning in the 1950s, due to the concentration of industrialisation efforts in major cities and the decreasing number of jobs in rural areas as a result of mechanisation in agriculture. The massive migration created low-income immigrant communities in major cities, resulting in massive informal urban development. Following the economic crisis and turbulence in the economy, social unrest and problems in the political regime during the late 1970s brought radical changes the economic policies that can be defined in terms of a shift from import substitution-protection to export-oriented liberal policies. After the 1980s, the country endured severe economic problems and, seeking immediate solutions, adopted new entrepreneurial policies to restructure the economy. The new policies favoured well-developed areas as well as coastal areas that were able to attract tourism or export-oriented production. As a result, large cities and coastal areas experienced very high rates of population growth, mainly coming from rural areas. The highest increase in the urban population took place in the late 1980s, where much of the growth was due to population movements from smaller settlements to metropolitan areas, especially to Istanbul. After the 1990s, there was a substantial decline in the natural rate of population increase. Despite these relatively lower figures, it still meant a population increase of around one million in urban areas between 1990 and 2000 and 1.2 million between 2000 and 2005.

In Sweden, the period from the 1950s to 1975 witnessed an economic boom, and urban policies were characterised by support for large-scale industrial zones,

offices, residential areas and transport infrastructure. Major projects included the redevelopment of the existing town centres, the construction of large shopping centres and enormous suburban developments in the so-called Million Homes Programme (*Miljonprogrammet*) between 1965 and 1974. As was the case elsewhere in Europe, the economic crisis in the 1970s and stagnation in industrial development led to a deep economic recession and slowed the pace of urbanisation. The focus of urban policies and planning moved from the construction of housing and infrastructure to tackling segregation through the renewal of social and physical environments in existing housing areas, which continued into the 1980s (Granberg and von Sydow 1998). In the 1990s, the framework conditions for urban development were deeply affected by another economic crisis a process of deregulation by the nonsocialist coalition in 1991. A new wave of modest urbanisation was set in motion in the late 1990s that is still continuing today. The strongest growth took place in the larger urban areas of Stockholm, Göteborg and Malmö, followed by ongoing densification processes in the centres and urban sprawl in their attached hinterlands (Schmitt and Dubois 2008).

In the Netherlands, prior to the 1970s, urban growth had been concentrated in urban agglomerations in the west of the country, known as Randstad. The rapid growth of the economy and rising population figures led to growing fears of unbridled urban expansion in the Randstad region (IDG 1997). The policy of *concentrated deconcentration*, introduced by the second memorandum on spatial planning in 1966, promoted new urban growth outside existing urban areas in a number of designated overspill centres (Bontje 2003). From the early 1960s to the early 1980s, a number of new towns were designated and built in an attempt to reduce pressure on the Randstad by encouraging the development of bordering areas (Bontje 2003; IDG 1997). The late 1980s and 1990s witnessed an increased interest in strengthening the international position of the Randstad. The principle of concentrated decentralisation was dropped, and the compact city emerged (Hoppenbrouwer et al. 2003). This principle was also triggered by increasing problems in the inner-city urban areas with the growing suburbanisation tendencies. The notion of the compact city suggested urban densification, brownfield development and extensions of existing urban areas. Between 1995 and 2005, the populations of the major cities had stabilised, and as far as residential development is concerned, urban sprawl was to a certain extent under control. However, at the end of 1990s, the rate of population growth in the rural part of Randstad was growing more rapidly than the rest of the country, although lower than during the 1970s (IDG 1997). In the meantime, inner-city decline became a major issue due to the concentrated decentralisation policy, which fostered an unprecedented wave of suburbanisation and substantial income differences between city centres and the suburbs (Schwanen et al. 2004; Dieleman and Wallet 2003).

The analysis of the dynamics of spatial development shows the importance of the changes in economic regimes and policies and, parallel to them, the changes in priorities in the development process, which defines the redistribution of population and population increases or decreases in cities affected by the immigration/emigration processes. In all four countries, the population movements have been key factors in defining the characteristics of urban development, although the nature of

migration is substantially different in each. In the Netherlands, immigration from Turkey, the Middle East and North Africa was triggered by government policies to fill low-skilled jobs from the 1960s onwards. Similar processes were experienced in Sweden, although immigration was also driven by asylum and social security reasons. In Turkey, people began to move from the poorer regions towards the large metropolitan cities to find jobs from 1950s onwards. Similar processes were experienced in Portugal in the 1960s, with low-income groups migrating to the more advanced Western European countries to find work. However, immediately after the decolonisation process following the 1974 revolution, not only Portuguese citizens returned back to the country but also a significant number of immigrants from Portuguese-speaking African countries.

5.3   Socio-Spatial Vulnerability to the Global Drivers of Change in Case Cities

This section aims to present the experiences of the case study cities (Istanbul, Rotterdam, Stockholm, Oporto and Lisbon) in terms of the *spatial redistribution of population and economic activity* and *socio-spatial segregation* processes and to analyse the socio-spatial vulnerabilities created by these processes of transformation. It can be seen from these case studies that, in some cities such as Lisbon and Oporto, redistribution processes caused *spatial transformations in the peri-urbanised areas* towards the edges in forms of suburbanisation and sprawl; the inner-city areas experienced *shrinkage* in doughnut patterns (in the centre) or its reverse (in the suburbs) and mosaic or perforation patterns (mixed type). In contrast, redistribution processes in other cities (e.g. Istanbul, Stockholm and Rotterdam) caused spatial transformations in the peri-urbanised areas; the inner-city areas began to be *intensified* through the recycling or redevelopment of existing sites, and new high-density areas were also developed.

Socio-spatial segregation is a process that has been experienced in all of our case study cities as a result of diverse community processes. In Lisbon and Oporto, socio-spatial segregation processes have led to the exclusion of some groups from certain parts of the city. Similarly, in Istanbul, socio-spatial segregation has been driven by rapid population growth and migration. In Stockholm, on top of the demographic changes and immigration processes, sectoral restructuring played a role in the segregation of different groups, while ethnic-based social exclusion processes have been the main drivers of socio-spatial segregation in Rotterdam.

Some cross-cutting processes, such as changing policy frameworks, property-led development and changing lifestyles, that are common to all of the case study areas (and elsewhere in the world) have also played an important role in the spatial transformations of each city. As our detailed case study analysis also displays, some of these socio-spatial vulnerabilities were triggered by certain policy-driven processes: these are discussed later in the book (Chap. 7).

5.3.1 Increasing Vulnerability of Cities due to the Redistribution of Population and the New Dynamics of Urban Growth

Diverse spatial transformations have been experienced in all of the case study cities; with *sprawl, suburbanisation, spatial fragmentation, polycentric development or concentrated decentralisation* resulting in different spatial patterns (see Table 5.3).

5.3.1.1 Portugal: Suburbanisation and Shrinkage due to Change of Regime, Rural Displacement and Immigration

The Metropolitan Area of Lisbon which includes the municipalities of Amadora, Cascais, Lisboa, Loures, Odivelas, Oeiras, Sintra and Vila Franca de Xira, was only recently legally acknowledged as an institutional and administrative body with its own authority. Nevertheless, plans for the area have been developing since the late nineteenth century, especially in transport infrastructure plans. However, in the absence of an effective Regional Spatial Plan, an intensive migration to Lisbon and adjoining municipalities began in areas served by suburban railways or near national railway stations, encouraging industrial development (PNPOT 2007; Silva 1994). These circumstances led to large-scale urban sprawl, which included: (1) areas of dense collective housing buildings in suburban areas that were linked to railway stations but lacked urban collective facilities and public space (e.g. Agualva-Cacém); (2) low-density areas with detached houses near links to commercial areas, often illegal and lacking basic public infrastructures (e.g. Fernão Ferro); and (3) slums in derelict areas bordering infrastructures and industrial areas in the city cores (e.g. Chelas). These trends of development were a major concern in the 1980s and 1990s (Soares and Jorge 1985; Salgueiro 2001).

In the 1990s, new forms of centrality associated with the knowledge-economy started to evolve. While industrial and dock areas in the centre became obsolete due to changes in the productive and economic system the former radial structure developed into a network system of motorways, creating opportunities for new growth areas along the main axes previously served by the train. Sintra experienced the highest population increase in the metropolitan area (39%), while Lisbon lost 15% and Amadora lost 3% of their populations. There was also a process of shrinkage in the core areas, the most dramatic being in the old mediaeval core of Lisbon (Sé, Santa Justa, Socorro) and Oeiras (Algés), which also experienced severe decay of its building stock. This region is characterised by an ageing population and an associated loss of employed residents. Similar trends can be seen in the southern part of the city, for instance, in Barreiro, an important industrial site with connections to the national port and railway networks, which experienced a significant loss of population by 8%.

The Oporto metropolitan region, which is characterised by dispersed urban settlements with the highest densities in the municipalities of Oporto, Matosinhos and

Table 5.3 Current urban growth dynamics in the case study cities

Country	Dynamic	Dominant spatial tendencies	Changes in the periphery	Changes in the inner city
Portugal	Population decline	Shrinkage	Low-density new land development	Historic preservation, renewal and regeneration
Turkey	Rapid urban growth	Sprawl and intensification	Fragmented new land development outside the city	Reuse of inner-city land: renewal and regeneration (historical areas/legalised squatter areas)
Sweden	Moderate growth	Physical expansion and polycentricity at the regional scale	Planned land development and functional integration due to regional enlargement	Reuse of inner-city land: renewal and regeneration (reuse of social housing estates, renewal of declining neighbourhoods)
The Netherlands	Moderate growth	Controlled decentralisation and compact development	Controlled and limited new land development outside the city	Reuse of inner-city land: renewal and regeneration with large-scale top-down projects

Vila Nova de Gaia, also experienced similar trends of shrinkage and sprawl. In the 1960s and 1970s, the sprawl process led to the formation of suburban towns. A key element in this period was the Oporto Improvement Plan of 1956–1966. The plan enhanced the housing conditions in the centre, where the population lived in the so-called ilhas (islands). The Municipality of Oporto became the biggest property owner in the country in this period (Cardoso 1996).

In the 1970s and 1980s, sprawl processes and the growth of the outer ring of peripheral municipalities were more evident, and population and activities became further scattered around the city. By the 1980s and 1990s, there was a strong disconnect between the central area, primarily based on the tertiary sector, and a vast periphery that was dominated by processes of industrial dispersion (Günther and Tavares 1994). Urban deconcentration trends have since been reinforced by investments in the metropolitan trunk road network and new radial and concentric axes and major junctions, creating new centralities and new mobility patterns. Residential deconcentration was accompanied by employment decentralisation, leading to the emergence of a new edge city on the outer ring of the metropolitan area. The superposition of these new patterns of territorial occupation on the traditional rural landscape is characterised by a dispersed type of settlement along the road network, generating a truly fragmented territory (Santos et al. 2009).

Since around 2000, the urban agglomeration (metropolitan area) of Oporto has become more complex and heterogeneous, with clear differences from the traditional model of a European metropolis. The city of Oporto did not undergo significant levels of polarisation, revealing various symptoms of economic and residential interdependence relative to the urban surroundings. The dispersed and centrifugal model of the Oporto Metropolitan Area has clear elements of polarisation, including the development of real estate and the expansion and diversification of the financial and hotel sectors.

5.3.1.2 Turkey: Sprawl Driven by Rapid Population Growth and Immigration and Property-Led Intensification

In Istanbul, the rapidly increasing population due to immigration and the concentration of economic activities, including most of the prominent industries of Turkey, are important factors behind the city's socio-spatial vulnerabilities. From the early 1960s onwards, important structural transformations in rural areas generated an excess of labour that began to migrate to big cities, where they could find employment often in marginal/informal service sector jobs and construction sectors (Tekeli and Erder 1978; Karpat 1976). Istanbul has been the main node of immigration since the beginning of the population flows. Reflecting this immigration process and the rapid population growth, Istanbul rapidly decentralised towards the periphery, while the inner-city areas were increasingly intensified as a result of different factors, including squatter renewal projects or luxurious redevelopment projects (see Chap. 11 for details) from the 1980s onwards.

The rapid growth of Istanbul's population created a new urban land and housing demand. From the 1980s onwards, new housing areas have been developed for different income groups, alongside the regularisation of the already built-up informal residential areas. The new schemes enforced changes in the administrative mechanism and brought new regulations. Beginning in the 1980s, the comprehensive planning system was extended substantially, giving different planning rights to different authorities. The provision of different rights to different authorities made fragmented urban growth possible as well as urban sprawl. This trend was accelerated in the 1990s and 2000s, creating a disorganised planning system.

The continued attractiveness of the city is evident from the increasing share of its population in the total, which rose from 9% in 1970 to 15% in 2000. Population growth is still excess of 4%, which is double the natural rates of population growth, attracting population from different parts of Turkey as well as abroad. This high rate of population creates various problems related to the expansion of the already settled areas as well as the increasing sprawl of this city region. Furthermore, the internationalisation of services and the attractiveness of Istanbul for foreign producer services brought about pressures of intensification and transformation of the inner-city areas. These two processes meant an increasing vulnerability of the Istanbul urban system. Firstly, the sprawl of the city created demand for land in the periphery in the watershed areas of the drinking water reserves, as well as in the forested areas to the north, which are crucial for the ecosystem. This residential and business growth is a significant threat to ecological sustainability. Second, the intensification and transformation in the inner zones led to gentrification and accelerated socio-spatial segregation, besides increasing traffic and pollution problems.

5.3.1.3   Sweden: Suburbanisation and Polycentric Development and Intensification of the Inner City

Stockholm was one of the three cities (together with Göteborg and Malmö) where a significant population increase was experienced in the suburbs (compared to the city itself) during the 1950s. In all cases, transport policy has been important in the process of suburbanisation. A programme of urban renovation and clearance and the development of large-scale transport infrastructure began in the city centre of Stockholm in 1952 and continued until the 1970s, by which time it had reached into the suburbs. This development raised public criticism connected from the environmental movement, especially in the late 1960s. This period, referred to as the "Record Years", characterised by extremely high development optimism, standardisation, environmental damage, growth of suburbs, expanding car use and laissez-faire planning. Major projects included the redevelopment of the existing town centres, the construction of large shopping centres and large suburban developments.

At the beginning of the 1980s, a new urbanism ideology emerged that called for a reorientation of housing policy. In the southern parts of city centre (Södra

stationsområdet), this resulted in the rebuilding and concentration of housing development (Gordan 2008). Another controversial area was in the northern part of Stockholm along the E4 motorway and around the Stockholm airport and university where an important goal was to balance regional growth between the northern and the southern parts of the region (Stahre 2007).

During the 1970–1980 period, people moved to the larger cities, while there was also an opposite movement from the bigger cities to neighbouring towns in search of a better quality of life (i.e. in terms of space, quality of housing and closeness to open spaces). During this period, population growth created problems for the highway system in Stockholm, when car ownership accelerated enormously (Hall 1998).

According to Nilsson (2007), the population increase in the suburbs was around three times as high as in the urban cores, which reduced the dominance of the three cities in their local labour markets so that almost 60% of the inhabitants in the metropolitan regions now live outside the cities of Stockholm, Göteborg and Malmö.

In the 1990s, the main objective of spatial planning in the Stockholm region was to improve the transport infrastructure. Thereafter, the old harbour and industrial areas were turned over for housing development as well as areas that had earlier been considered unsuitable for building or which were designated as green areas (Hall 2002). The Million House Programme was renewed as a result of social, cultural and architectural incentives to respond to the ongoing socio-spatial segregation processes, and new investments were made in the transport infrastructure with the aim of improving the public transport system. A new wave of modest urbanisation was set in motion in Stockholm in the late 1990s which is still continuing today. The strong urban growth in Stockholm has been followed by an ongoing intensification processes in the centre, along with urban sprawl in the hinterland (Schmitt and Dubois 2008).

5.3.1.4 The Netherlands: Polycentric Development Led by a Concentrated Decentralisation Policy and Intensification of the Inner City Led by Urban Regeneration

Prior to the 1960s, urban growth in the Netherlands was concentrated in urban agglomerations in the west of the country in the Randstad – the economic heart of the country. From the early 1960s to the early 1980s, as a result of a national polycentricity policy, a number of new towns were designated and built in an attempt to reduce pressure on the Randstad, along with some spatial policy documents to encourage the development of areas in the north of Holland, in Flevoland and in the Delta area (Bontje 2003; IDG 1997). However, due to population growth, increased car ownership and demand for lower-density residential areas, the number of people moving to towns and villages in the green central area (the Green Heart) increased throughout the 1960s (IDG 1997), while migration from big cities towards the small towns and villages continued throughout the 1970s. Between 1970 and 1985, the population of the three largest cities (Amsterdam, the Hague and Rotterdam) fell by an average of more than 18%.

In response to these dynamics, the national spatial policy went through a process of transformation. A number of cities bordering the Green Heart, namely, Amsterdam, Utrecht, the Hague and Rotterdam, became more connected and polycentric, while the inner-city urban areas saw an increase in suburbanisation tendencies. The notion of the compact city was introduced focussing on urban intensification, the regeneration of brownfield areas and the extension of existing urban areas. During this period, the population of the Rotterdam stabilised, and as far as residential development was concerned, urban sprawl was brought under control.

At the end of 1990s, the rate of population growth of the Green Heart was higher. In the meantime, inner-city decline became a major issue as a result of the concentrated decentralisation policy, which fostered an unprecedented wave of suburbanisation and substantial income differences between the city centres and suburbs (Schwanen et al. 2004; Dieleman and Wallet 2003).

In Rotterdam, the implementation of a polycentric urban development policy is evident in the inner-city and peri-urbanised areas of the city. After sustaining severe damage in the Second World War, the city was extensively redeveloped. In the 1960s, old neighbourhoods were redeveloped and upgraded, mainly in large-scale projects along large boulevards. In the mid-1980s, metropolitan projects were initiated that included the large waterfront project Kop van Zuid. From the early 1990s, urban development has taken place in the city and also in surrounding suburbs and other closely connected cities and villages. Under this programme, new housing areas in the north of the city were developed (e.g. Nesselande on the north eastern edge of the city).

5.3.2   Increasing Vulnerability of Cities due to Increasing Spatial, Social and Economic Inequalities and Socio-Spatial Segregation

The *socio-spatial segregation* of diverse groups defined by social, ethnic, cultural or economic characteristics is a common phenomenon in cities that have experienced large-scale immigration. In most cases, people with similar backgrounds prefer to live close to each other, for social networking reasons or simply affordability reasons. Economic conditions were of course also a great incentive to finding the most affordable neighbourhoods. Various groups of immigrants tend to live close to each other either in social housing areas (in welfare states like Sweden or the Netherlands) or in squatter areas if the provision of affordable public housing is not available or limited (as in the case of Portugal and Turkey). Moreover, as the case studies show, the wealthy parts of society may prefer to live in isolated housing areas, sometimes in the form of gated communities and sometimes simply in neighbourhoods in which immigrants cannot afford to live.

5.3.2.1 Lisbon and Oporto: Socio-Spatial Segregation of Poor Immigrant Communities

Throughout the 1960s, there was a large wave of migration of people, mostly poor, from other areas of the country to the large urban agglomerations, where the government was unable to fulfil housing needs. This resulted in the expansion of illegal neighbourhoods, slums and an overcrowding of available housing. With the decolonisation and the return of emigrants during the period 1974–1976, this situation was aggravated, further increasing the suburbanisation. In 1974, as a response to the housing difficulties, rents were frozen, and this meant that some landlords were unable to afford to maintain their properties. As a result, various rental properties fell into disrepair, and the rental market declined. In recent years, steps have been taken to ease the control of rents, but the owner-occupant market still prevails. For this reason, investments in historical and consolidated urban areas, urban renewal and a revitalisation of the central areas have become key issues on the urban agenda.

The most vulnerable spaces are the urban and semiurban areas, where approximately three quarters of the poor population are concentrated (MAOTDR 2008). Poverty in Portugal is concentrated among the elderly and young. The unemployed, self-employed and retired are particularly vulnerable to poverty in Portugal, as well as people with disabilities, the homeless and immigrants.

5.3.2.2 Istanbul: Inherited Socio-Spatial Segregation due to Rapid Population Growth, Migration and Growing Spatial Inequalities

In Istanbul, socio-spatial segregation has been an issue since the 1950s as an outcome of immigration from the rural areas. During the 1960s and 1970s, *gecekondu* (informal housing) areas became spaces of reproduction of informalities and acted as a buffer mechanism in the absence of a formal social security institutions and public services. Migrants coming from different parts of the country preferred to live in close proximity to their families, relatives and *hemşehri*'s (compatriots). Although the *gecekondu* settlements were contrary to regulations, municipalities and central governments accepted that the emergence of such areas was inevitable and tolerable due to their limited demand for capital investment. As the informal housing areas grew, some municipal services were brought to these areas, although they were lower than the accepted official standards. In time, it can be said that while *socio-spatial segregation* did not increase, it did become more visible.

While the economy was growing as a result of strong privatisation and a market-oriented transformations throughout the 1980s, two important dynamics brought new spatial inequalities to Istanbul. First, the spatial separation of social groups on the basis of income and social status became more apparent. Second, the regularisation of illegal housing areas under new legal arrangements, created a profit-making mechanism in the form of redevelopment projects. This process changed the profile

of these neighbourhoods as the rural immigrants began to move out to other areas and other urban lower-income groups began to move in. Finally, a new group of entrepreneurial urban rich appeared with clear residential preferences and lots of money to spend.

A clear *socio-spatial segregation* pattern existed throughout the 1980s that underwent a slight change in the 2000s as the dynamics became more complicated in the wake of new housing and transformation projects by the Housing Development Authority and other local government agencies (Eraydin 2008a). Areas with a occupied by high density of transformation projects were mainly occupied by high income white-collar workers (scientific and technical employees, managers, administrators and people working in financial and commercial activities) according to the studies of Güvenç and Işık (2002) and Eraydin (2008b). The growing income disparities of the mid-1990s began to be reflected in the creation of super luxurious residential developments and commercial property developments built with international capital, while local governments also became more open to property-led urban development projects. The development of first-generation gated communities also contributed to a clear definition of the boundaries between the better- and worse-off parts of urban society. Increasing capital accumulation in the city, let to a growth in the popularity of gated communities gained in momentum in the mid-1980s in line with new consumerist lifestyles (Kurtuluş 2005). However, the real boom in such enclosed housing areas (not only in the form of villas with large gardens but also of gated residential towers) took place from the end of the 1990s onwards (Kurtuluş 2005).

5.3.2.3   Stockholm: Socio-Spatial Segregation due to Demographic Change, Migration and Sectoral Restructuring

In Stockholm, *socio-spatial segregation* was caused by a combination of factors, such as government housing policies, demographic change related to increasing numbers of immigrants and decreasing natural population growth, growing income differences in terms of disposable incomes and new divisions of labour.

Government housing programmes have been an important trigger to socio-spatial polarisation. In addition, the increasing numbers of immigrants has created spaces of vulnerability in the city. In the first decade of the twenty-first century, the population of the Stockholm region increased relatively quickly. The 1970s and 1980s were marked by a period of both high inward and outward migration, when immigrants, many of them well educated, came from across the whole country but especially from neighbouring regions (Johansson and Persson 2004: 112–118). The net migration between Stockholm and the rest of Sweden was negative in the period 1990–1995, although the population in Stockholm increased by 200,000 between 1990 and 2002, corresponding to a 13% growth rate (compared to 4% in the whole country) (Hermelin 2004: 9). At the end of the 1990s, immigration was the main reason for growth, but after that time, it was a natural increase of population that accounted for much of the growth. At the same time, the relative share of the population over 65 years of age increased. Between 1997 and 2007, the number of inhabitants rose by

11% (compared with 2% in the rest of Sweden). Due to the current baby boom and the continuing in-migration, it is forecast that this trend will continue in the future.

The growing difference in disposable income is another important factor that has added to socio-spatial segregation. This situation became visible during the 1980s when the incomes of immigrants decreased more than those of the natives. Poverty among people born outside Europe rose and homelessness increased, although the number of people on social assistance decreased. From 2000 onwards, the amount of assistance per family increased despite a decrease in the number of people receiving social assistance. In this period, big differences in incomes and participation in the labour market between natives and foreigners became visible in the city.

Finally, the changing employment structure and economic restructuring influenced *socio-spatial segregation*. During the 1960s and 1970s, three quarters of industrial jobs disappeared from central Stockholm (Sjöberg 2008), which was partly compensated by the growing service sector, particularly during the 1980s. In the 1990s, growth was driven by the ICT in sector and other knowledge-intensive industries and services. Despite the burst of the high-tech bubble in 2000, the economy continued to grow (OECD 2006). The rate of labour market participation among both women and men is high, but there is still strong gender segregation (RTK 2007). Other current challenges are the late entry of young people into the labour market and the difficulties faced by immigrants in finding employment. The latter is most notable in the city of Stockholm (OECD 2006). Due to this combination of factors, a visible physical segregation of different social, ethnic and cultural groups in Stockholm and its surroundings has occurred.

5.3.2.4 Rotterdam: Ethnic-Based Socio-Spatial Segregation

In the Netherlands, it can be argued that the *socio-spatial segregation* of ethnic immigrants of non-Western origin is an issue that was initially triggered by the centrally planned social housing policy. Based on neighbourhood level data, Hartog and Zorlu (2009) could find no evidence of mono-ethnic neighbourhoods in the country, but they found a high concentration of immigrants of non-Western origin in certain inner-city neighbourhoods of the larger cities. Since housing provision is a centrally planned activity in the Netherlands, it is possible that the housing composition in neighbourhoods plays an important role in attracting immigrants with weak socio-economic positions, who are often from a variety of non-Western countries rather than a single origin (Hartog and Zorlu 2009).

From the 1950s onwards, ethnic minorities (mainly Turks and Moroccans) moved in and replaced the residents of the inner city, who moved towards the edges of the city (and beyond) for more spacious and better quality housing. Later, other ethnic groups also moved into these neighbourhoods, renting cheap and low-quality housing. Both the increasing migration of unqualified labour to the city and the recession at the end of the 1970s and beginning of 1980s had an important influence on the social characteristics of the city. Unemployment, crime and social issues constituted the major characteristics of the social structure of the inner city. In the

early 1980s, the municipality of Rotterdam developed several programmes to modernise and broaden the city's socio-economic base with projects like "New Rotterdam" and "Social Renewal of Rotterdam" (Miedema et al. 2002). At the same time, education programmes (such as *Samenwerkingsverband* "*Rotterdam Werkt*" – Rotterdam Works) were launched to help people with low levels of education find employment in the newly developing economy; however, the majority of unemployed stayed unemployed (ibid). Towards the end of the 1980s, local job creation programmes were developed, but these mostly failed to increase the qualification levels of the unskilled unemployed. During the 1980s, urban regeneration projects delivered improvements in the quality of housing although various social objectives (e.g. health, unemployment, education and crime) were not achieved (ibid). Moreover, these urban regeneration projects did little to change socio-spatial segregation: the same people stayed in same neighbourhoods, albeit in better housing (but without mixing with higher-income groups through gentrification process) but at higher rents ibid. In the 1990s, some social renewal programmes were introduced to connect social and employment policies.

5.4   Conclusions

Space is not merely a physical entity. As Soja (1980: 209) observes, "Space and political organisation of space express social relationships but also react upon them". Hence, spatial change reflects not only spatial/ecological vulnerabilities but also social vulnerability areas. With this in mind, this chapter has attempted to define the urban growth and transformation dynamics that have resulted in *socio-spatial vulnerabilities* in the case study cities. We have argued in this chapter that spatial and functional transformations and redistribution of population and activities contributed to the socio-spatial segregation processes, which increase the vulnerability of urban systems. As we illustrated in our case study cities, these weaknesses are created by certain demographic (population and urban growth dynamics) and socio-spatial transformations (spatial, social and economic inequalities and socio-spatial segregation), that affect the resilience of cities because they limit the *interconnections* and *interdependences* between the different social groups in these cities. With illustrated cases, we have linked the spatial fragmentation tendencies (caused by diverse urban growth tendencies) to increasing *social discontinuities* and loss of *collective action*. As introduced earlier (Chap. 1), three dynamic assets, namely, adaptive capacity, self-organisation and transformability, are needed for urban systems to be resilient. This chapter illustrated that *social discontinuities* are increasing in cities due to certain urban growth dynamics created by transformation processes and these tendencies decrease the capacity of urban systems for adaptive actions, self-organisation and transformability.

  The empirical sections of this book (namely, Chaps. 10–13) demonstrate how the resilience of selected urban systems is affected by these specific vulnerabilities. This chapter has demonstrated that there are some important differences in

structural characteristics as well as the policies that were adopted in the selected cities. In general, the cities have expanded towards the periphery, either in the form of planned suburban towns or simply as sprawling patterns. As a result, Istanbul, Stockholm and Rotterdam have experienced an intensification of the inner-city areas through redevelopment and regeneration projects and a gentrification and socio-spatial segregation processes in the inner-city neighbourhoods. In contrast to this intensification process, Lisbon and Oporto have experienced decline and dereliction, while spatial transformations have taken place towards the periphery of the urbanised areas.

In places where inner-city decline has occured, the mobility of people has been high. Some built-up areas or individual buildings emptied and began to decline, while others have been occupied by new residents, resulting in *social discontinuity* in the neighbourhoods concerned. Spatial processes related to the intensification of inner-city areas, like gentrification and regeneration processes, which led to spatial segregation of different income groups, have also added to the *social discontinuity*. This is also true for the dense elitist, property-led regeneration projects and gated communities, which have caused certain displacements in cities. As discussed in the introduction, *social discontinuity* in cities is one of the basic sources of socio-spatial vulnerabilities that negatively affect certain attributes of resilience, namely, adaptability, capital building and especially connectivity (both physical and social) between different groups.

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Chapter 6
Systems, Cultures and Styles: Spatial Planning in Portugal, Turkey, Sweden and the Netherlands

Sofia Morgado and Luís F. Dias

6.1 Introduction

Planning systems tend to adjust to the ever-changing urban conditions, though similar urban trends can be found in different spatial forms (e.g. sprawl, shrinkage and polycentricism). The questions raised by these phenomena and dynamics are often answered differently, based on the individual planning systems, cultures and styles, and in reference to the planning tools inherited from earlier periods.

This chapter aims to show the different approaches of four European countries to urban conditions, which have become generalised in an urbanised world: Portugal, Sweden, the Netherlands and Turkey.[1] First of all, the role of each national system within the wider scope of policies and planning cultures in recent years are elaborated, after which a comparison is made of the various planning systems.

6.2 European Planning Cultures in Recent Years

It is often argued that most of the European Union's influence on spatial development patterns is due to sectoral policies and legislation agreed by the member states and further implemented by the national systems. There is no actual EU competence

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[1] The chapter includes contributions from all partners that have participated in the research project *SUPER-Cities: Sustainable Land-Use Policies for Resilient C*ities.

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for spatial planning; nevertheless, common sectoral policies in the fields of the environment, agriculture and transport, together with funding, joint spatial development strategies and cooperation, have resulted in similarities in the national systems and laws of the member states (Dühr et al. 2010). These policies and legislations have contributed not only to the design of spatial patterns in the European territory but in particular to the design of *change* in each national system.

National planning systems have their roots in different laws and codes. With regard to current arguments on the development of a European model for spatial planning, recent literature offers an up-to-date perspective of the impact of different planning families and cultures (Knieling and Othengrafen 2009). Not surprisingly, these approaches show an ever-increasing degree of articulation between each family within Europe in terms of policies and legislation.

The current systems may be considered as being a product of the respective cultures and legal families. According to Zweigert and Kötz (1977), a theory of legal families would seek to define the different aspects of comparative law. Such an approach would require a broad range of methodological tasks, ranging from assessing how the vast number of legal systems can be categorised under a few larger groups to how the groups should be and, after defining that, deciding whether certain systems would fit in one or another group. Obviously, if a system can be defined as being representative of a larger group, the overarching task of comparing different families by resorting to a couple of systematised examples would then become more feasible.[2] That said, it is very difficult to find a planning system that fully represents all planning cultures and legal families. Different authors may develop similar approaches by looking for stylistic features within each system; however, the fundamental factors to be considered when assessing the individual styles of legal families would be their history of development, the mode of thought in legal matters, distinctive institutions, legal sources and ideologies.

Regarding the distinctive modes of legal thinking, there has been a tendency to use abstract legal forms and to develop well-articulated systems in the Germanic and Romanistic families, whereas English common law resorts to empiricist approaches (Zweigert and Kötz 1977). Thus, it may be accepted that English common law is rather distinct from the continental European systems, which stem, in different forms, from Roman and Germanic laws. This approach to defining the legal families in Europe has been followed in other comparative studies, such as one by Newman and Thornley[3] (1996). However, these authors have raised a different debate that focuses on the relationship between the legal families and their countries. This new insight has exposed the need to discern between cultures of planning and actual proceedings and methods, i.e. at an institutional level (Newman and

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[2] Esmein (1905, cf. Zweigert and Kötz 1977) divided the legal world into the Romanistic, Germanic, Anglo-Saxon, Slavic and Islamic families.

[3] From the national planning systems standpoint, five families would be identified: British, Napoleonic, Germanic, Scandinavian and Eastern European.

Thornley 1996). These various perceptions have provided a basis for the *EU Compendium of Spatial Planning Systems and Polices* (1997), which has been further developed by Dühr et al. in 2010. According to this literature, there are four *ideal* styles of planning that are embedded – with different shares and levels – in the various planning systems of Europe: *regional economic planning approach, comprehensive integrated approach, land-use management* and *urbanism tradition*. As the definitions of these planning systems below suggest, they are not mutually exclusive, as there are some overlaps (see Table 6.1).

The *regional economic planning approach* follows a very broad understanding of spatial planning that is related to the pursuit of wide social and economic objectives, especially in relation to disparities in wealth, employment and social conditions between a country's different regions. This approach relies on a strong central government, playing an important role in managing development across the country and in undertaking public sector investments. In contrast to the *regional economic planning approach*, the *comprehensive integrated* approach focuses specifically on spatial coordination rather than on economic development. The *comprehensive integrated* approach is characterised by an understanding of spatial planning, which is rooted in a systematic and formal hierarchy of plans from national to local levels, and the coordination of public sector activities across different sectors. Two sub-types of *comprehensive integrated* approach have been identified, one being related to federal systems and the other to strong local authorities that share responsibility with the central government. The tradition of *land-use management* has an understanding of (spatial) planning that is focused on the narrower task of controlling changes in land use at strategic and local levels. Accordingly, it is regulation that is the main instrument in ensuring that development and growth are sustainable. The *urbanism* tradition is strongly influenced by architectural aspects and concentrates mainly on issues of urban design, townscapes and building control.

This simple framework allows a characterisation of the national systems of Portugal, Sweden, the Netherlands and Turkey, backed by evidence from the broad range of methods adopted by the individual countries. Although all four styles of planning are present in different weights in each country, some may be more recognisable for one or two of them, depending on its background and its contributions to other planning systems.

6.3 An Outline of the Various Planning Systems

National planning systems, their cultures and backgrounds, especially under the impact of common recommendations and policies, tend to have characteristics that are rooted in more than one of the above planning styles. The different historical and geographical backgrounds of these four countries offer a view of different planning cultures in this book (Knieling and Othengrafen 2009).

Table 6.1 Planning systems' review applied to the four national planning systems (most representative styles according to this study)

| Legal families and planning cultures			Styles [models or traditions] of European spatial planning	Spatial planning in Portugal, Turkey, Sweden and the Netherlands
Davies et al. (1989)	Zweigert and Kötz (1977)	Newman and Thornley (1996)	EU compendium (1997) Dühr et al. (2010)	
	The Nordic legal family	Scandinavian	Comprehensive integrated approach Vertical, horizontal and cross-border coordination of public policies' spatial impacts	Sweden The Netherlands
English common law	The Anglo-American legal family	British	Land-use management approach Regulation of land-use change resorting to strategic and local plans	Turkey
Napoleonic codes	The Germanic legal family	Germanic	Regional economic planning approach	Portugal Sweden The Netherlands Turkey
	The Romanistic legal family	Napoleonic	Regional economic approach: mitigation of regional economic and social disparities by inducing public intervention programmes	Portugal
			Urbanism tradition Urban and landscape design, considering zoning, urban and building codes	The Netherlands
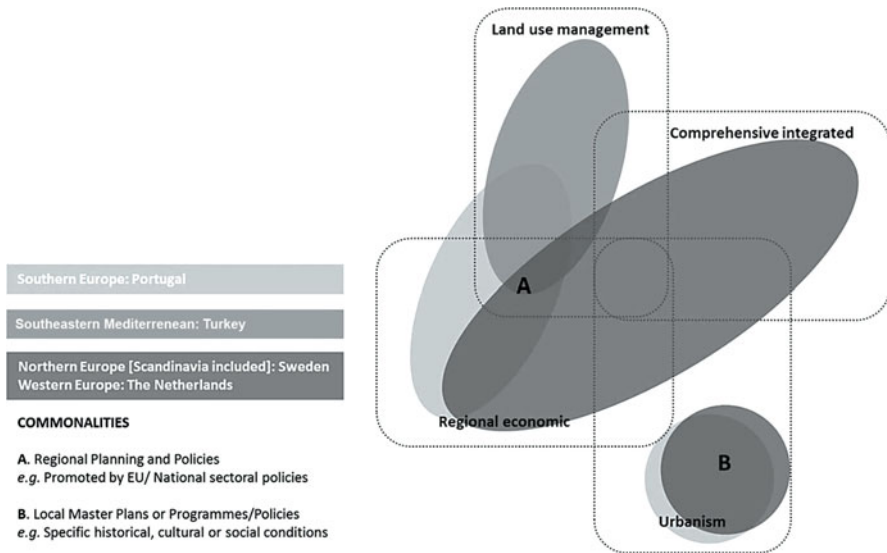
Fig. 6.1 Styles of planning and national planning systems: Portugal, Turkey, Sweden and the Netherlands (Source: FA-UTL, LUOTP and adapted from Dühr et al. 2010: 181; Nadin and Stead 2008, based on the EU Compendium)

With their own peculiarities, Sweden and the Netherlands share north-western European planning origins, with planning systems stemming from the Nordic or Scandinavian legal family, having facets of the *comprehensive integrated approach*, whereas the *regional economic planning approach* inherits aspects from both the Germanic and the Romanistic families, hereafter referred to as the Napoleonic codes.

Portugal and Turkey are southern European countries, but present important differences in their planning systems. The Portuguese planning system seems to be based strongly on both branches of the Napoleonic codes, being Germanic (and partially the Romanistic, as well) in its approach to *regional economic planning* and Romanistic in its *urbanism tradition* style. As for Turkey, the two styles that are most evident are *comprehensive planning,* with emphasis on *land-use management*, and the *regional economic planning* (see Fig. 6.1).

6.3.1 The Portuguese System, Culture and Style of Planning: A Strong Urbanism Tradition

The Portuguese national system combines two dominant models coming from the Napoleonic tradition: the *regional economic planning approach* (Dühr et al. 2010) and the *urbanism tradition*, with roots in the Mediterranean states. This combination allows the integration of a strategic dimension into the national system, particularly

at a regional level, which somehow softens the model and sometimes becomes too rigid to deal with the various levels of planning. This is common also to other southern European countries, such as Spain and Italy, where the *urbanism tradition* has an even more significant role in urban development.

In the context of this group of four countries, the *urbanism tradition* is specific to the Portuguese national system, especially since the recent advent of the so-called Polis XXI Programme. Urban design approaches with advanced architectural and landscape dimensions have been contributing to improvements in planning and design (Morgado et al. 2010).

From an urban architectural perspective, the main goal of the *urbanism tradition* is to design and create places. From a planning perspective, on the other hand, it resorts to tools that include zoning, design codes, building control and development plans, evolving into approaches, which may act at the level of a large-scale design.

The *urbanism tradition* finds its preferential expression at the municipal level of planning, where the strategies defined at the higher levels of planning are implemented. It may also be seen as a way of establishing the urban spatial organisation (Urban Development Plans) and the urban design for a specific area of the municipality (Detailed Plans). The other styles of planning intervene as well, with different shares and at different levels and with the *comprehensive integrated approach* appearing to be important as an interface between national, regional[4] and local levels.

However, gaps between the levels of intervention in which there is scarce interest in strategic dimensions are apparent, even though environmental and societal relationships are acknowledged as fundamental (European Communities 1997). As such, new policy updates may contribute to reinforcing the ties between levels of governance through institutional empowerment, inter-institutional cooperation and policy coordination (CCDRLVT 2007). To date, local planning institutions have acted as the executioner of regional strategies, with no effective governance legitimacy and few participatory tools. A lesser efficient control in urban development becomes even more evident in the face of the sectoral policies induced by EU programmes, together with a still feeble multilevel capacity.

In Portugal, the *National Framework of Spatial Planning* defines the different levels of national planning. At a national level, the policies follow the *National Spatial Development Policy Programme*, with the guidelines of this national programme transferred to the regional level through the Regional Spatial Plan documents, which are detailed with a stronger physical expression in the several Municipal Spatial Plans (Pinho et al. 2010). Accordingly, the *regional economic planning approach* may be mostly evident at the national and regional levels, widely linked to the governmental agendas for which the sectoral plans are especially relevant. The *National Spatial Development Policy Programme* (PNPOT) addresses particular concerns and strategies with regard to regional disparities.

Finally, *land-use management* is more evident at the national and local levels. The Municipal Master Plans have a strong influence in the control of land-use adjustments. At the national level, the *National Agricultural Reserve* regulates and

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[4] Portugal has no regional planning authority.

classifies the suitability of soil, and the *National Ecological Reserve* is charged with protecting the coastal zones, river basins, interior water bodies (reservoirs, lakes), areas of maximum infiltration and areas with steep topographies. These tools may be considered as forms of land-use management; however, they are not plans *per se* but rather public utility easements that are dependent on sectoral plans, such as spatial plans for coastal areas.

Recent advances in national planning have been a result of new tools for intervention at a local level and thus from an urbanistic perspective. The new procedures allow for urban rehabilitation and regeneration,[5] while also promoting urban containment by preventing the reclassification of rural land as urban, aside from exceptional cases when an unavailability of urban land is demonstrated, such as in the event of an unexpected demographic rate.[6] An application of these measures is expected to allow for the consolidation and densification of urban settlements.

These advances follow various EU recommendations aimed at promoting urban sustainability, such as the Aalborg Charter (1994) and Commitments (2004), the Leipzig Charter (2007) or the New Athens Charter (2003). The latter was introduced by the European Council of Spatial Planners (Pereira and Nunes da Silva 2008), which is already considered as a promoter of resilience (see Newman et al. 2009).

6.3.2 The Turkish System, Culture and Style of Planning: Different Styles at Different Planning Levels

The Turkish planning system is a combination of different styles and is in some ways similar to the Portuguese planning system. In the Turkish planning system, the *regional economic planning perspective* holds an important role. Taking into account macroeconomic targets, social development and sectoral objectives and policies, the State Planning Organisation (SPO) defines the general principles and objectives in the *National Development Plan*. The *National Development Plan* publishes guidelines for resource management or sectoral plans and programmes at the national level, as well as some basic principles for regional development. Regional plans also come under the scope of the SPO and are prepared on an ad hoc basis. New institutions operating under the auspices of the SPO, such as Regional Development Agencies, have been recently established in several regional centres (since 2006) to coordinate public policies with the private sector, as well as to prepare regional plans to regulate development activities.[7]

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[5] Decree-Law n.º 307/2009.

[6] Regulatory Decree no: 11/2009, which defines criteria for the classification and reclassification of land use, as well as criteria and categories of urban and rural land use.

[7] These plans are approved by the State Planning Organisation. In 2010 and 2011, each of the Regional Development Agencies (26 in number – see http://www.dpt.gov.tr/bgyu/biid/ibbs.html) prepared their own Preliminary Regional Plans.

The regional plans, however, only provide general guidelines, and attempts to link these plans with the land-use management model have been through the Environmental Management Plans. The Ministry of Environment and Forestry prepares and approves Environmental Management Plans, generally in close cooperation with the local governor's office, while land-use master plans are set for areas within the boundaries of the greater city municipalities. Environmental Management Plans aim to coordinate land-use development plans prepared for the settlements within the designated subregions (usually covering more than one province) or greater city municipalities.

The *land-use management* model is closely associated with the important task of controlling the use of land and land-use changes at strategic and local levels. In this model, the use of land and property are fundamental. In the Turkish model, different to the UK system, which tries to control the use of property and land through effective regulation, the control of urban development is through Urban Development Plans. While the planning system tries to control the urban spatial organisation through Urban Development Plans at different scales, the *comprehensive integrated approach* appears to be important as an interface between the national, regional and local levels. In this regard, Turkey may be considered as a country in which *land-use management* is important within the planning system, while urban design, however, is rather a new phenomenon in planning practice.

At the local level, the Turkish spatial planning system includes (1) the *urban master plan*, prepared by the municipalities, and (2) *local implementation plans*, designed by the municipalities. These plans define local land uses, such as built areas, roads and the location of technical infrastructure (Eraydin et al. 2010). The urbanism tradition, on the other hand, is a resource of municipalities and different central government authorities that is used in specifically designated areas. Municipalities prepare local plans that identify zoning regulations (Eraydin et al. 2010), while urban design is limited to some designated public spaces or private sector initiatives.

Since the 1980s, Turkey has followed an increasingly neoliberalist economic agenda, contributing to the transformation of urban legislation. New amendments to the legislation are introduced with the aim being to attract large-scale international projects and to respond to the current demands of the property market, providing certain planning rights to different public bodies. The Ministries of Culture and Tourism, Industry and Trade and Environment and Forestry and also the Ministry of Public Works and Resettlement are empowered to prepare and approve land-use plans for their own areas of interest (Eraydin and Altay 2011). Consultations with municipalities on plan preparations and approval are carried out; however, the ministries are not obliged to accept the municipalities' decisions.

This situation, along with a growing compartmentalisation of planning, has brought negative impacts to the implementation of sustainable policies. A review of legislation and plan documents within the different periods shows that there have been no explicit intentions or measures to promote sustainable urban development or create ecologically resilient cities, and for this reason, steering market dynamics and private promoters towards resilient thinking in urban planning has been difficult in Turkey.

6.3.3   The Swedish System, Culture and Style of Planning: The Importance of a Comprehensive Integrated Approach

The Swedish national planning system incorporates two planning styles, both of which are considered as central to their approach: the *regional economic planning approach* and the *comprehensive integrated approach*, which are consistent with the Nordic tradition of planning. Despite the important contribution of this planning system in terms of the *regional economic planning approach*, the *comprehensive integrated approach* is often considered as evocative due to its representativeness and strong planning culture and its background in Europe.

The *regional economic planning approach* is distinctive (1) in Nordic countries where considerable reliance has been placed on a rational planning approach and public sector investment. In this case, local authorities have played a dominant role, albeit sharing responsibility with central government, and (2) in Austria and Germany, where a similar systematic structure and process is followed under a federalised configuration by "regional governments" (*Länder*), which play a relevant role, especially in Austria (EC 1997). Public sector activities are also coordinated across different sectors.

The *comprehensive integrated approach* encompasses multilevel actions, usually with a sophisticated perception of spatial coordination. According to Dühr et al., it is wide ranging in scope, with its main goal being to allow for the integration of the spatial impacts of sectoral policies – horizontally (across sectors), vertically (between levels) and geographically (across borders) (2010). This model is also known for its strong public sector component, mature planning institutions and political commitment. In the case of Sweden, its integration into the Baltic Sea Region (BSR) and the development of various transnational and cross-border plans and institutions[8] contribute, to some extent, to this flexible and integrated view of planning (Schmitt et al. 2008).

Besides the cross-border plans, for which the BSR is paradigmatic, the *comprehensive integrated approach* is also applied vertically to the various levels of planning. With the aim of monitoring a region and providing basic planning data, the government may appoint a regional planning body should a common interest emerge among several municipalities (e.g. in the Stockholm region). The *Planning and Building Act*, introduced in 1987, constitutes the main statutory guide for spatial planning in Sweden and has further strengthened the power – from a European perspective – of the very large municipalities in Sweden (which have decreased in number from more than 2,600 in 1952 to 290 today). Since then, comprehensive municipal plans, although not legally binding, have been mandatory and are used increasingly in municipal development programmes, with particular focus on areas of public interest, like housing, employment, the environment and even the well-being of the public in the form of social welfare goals (Schmitt et al. 2010).

Comprehensive municipal plans are to be adopted by the municipal council; however, if these override national or inter-municipal interests, the county administrative board may review the municipality's decision (e.g. planning transport infrastructures, financed for the most part by the state), thus acting as a kind of regional advisory body.

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[8] For instance, the Nordic Council.

The Comprehensive Plan constitutes also the framework for the development of detailed plans for smaller areas within the municipality, which are legally binding and must be adopted by the municipal council. This is a good illustration of an executive planning instrument, being a legal agreement between the municipality and either public or the private landowners. The Detailed Development Plan actually implements the Comprehensive Plan for a 5–15-year period following a more urbanistic approach, since it specifies areas intended for public or private buildings and even requirements for the design and construction of buildings and protective measures for developed areas (Alfredsson and Wiman 1997; Larsson 2006).

If several municipalities have a common interest in a plan, the government may appoint a regional planning body to monitor regional concerns and to provide basic planning data to the municipalities and government authorities. The greater Stockholm region is the only case to date in which such a body has been established, where its task is to develop informal and indicative but comprehensive regional plans. In addition, there are a number of other administrations at the national level that provide information and competence to spatial planning in Sweden and assure conformance with associated laws, such as the Swedish Board of Housing, Building and Planning (*Boverket*), the Central Board for National Antiquities and the Swedish Environmental Protection Agency.

The *Act on the Management of Natural Resources* was launched alongside the Planning and Building Act (Guinchard 1997); however, it was replaced in 1998 by a more comprehensive environmental code covering all issues related to the protection of nature and environmental resources (air, water and soil) and offers guidance for environmental impact assessments and is thus integral to planning projects and land-use management issues.

According to Nilsson (2007), political interest has been more focused on regional rather than urban development, especially in the sparsely populated parts of the country. Regional development programmes at the county level and with an explicit economic focus (e.g. to strengthen clusters, entrepreneurship or the innovative climate) help to balance national regional disparities. Controlled and monitored by the national government and corresponding institutions (e.g. Tillväxtverket), these programmes are not intended to intervene in explicit spatial planning or even land-use management issues.

In a way, planning in Sweden can be said to have reached a level of efficiency and adaptability to new situations that allows the system to adjust to new conditions by resorting to integrated and comprehensive approaches, ensuring a certain degree of resilience in planning.

6.3.4 The Dutch System, Culture and Style of Planning: The Comprehensive Integrated Approach, with Increasing Power of Local Authorities

In the Netherlands, the central government is the main source of funding for planning at all levels and thus retains great influence (Faludi 2005). From this standpoint, besides the importance of the *comprehensive integrated approach* (EC 1997), it also

has elements of a *regional economic planning approach* (Dühr et al. 2010). According to Alexander (1992), spatial planning in the Netherlands relies on a passive regulatory system in which interventions follow a prior assessment and stakeholders are consulted at an early stage of the planning procedure. The EU Compendium describes the Dutch planning system as one of the most elaborate examples of the *comprehensive integrated approach* to planning, in which "plans are more concerned with the coordination of spatial than economic developments" (European Communities 1997). National planning in the Netherlands is based on indicative national policy documents rather than master plans. Statutory plans are the responsibility of the provinces and municipalities, but only the latter have the power to make plans that provide grounds for the refusal of planning permits (Faludi 2005). Therefore, consultation and persuasion is needed if the policies of the top levels of government are to be integrated into the plans of the lower levels (Zonneveld 2006).

The Dutch planning system is legally binding, and therefore developments must be in accordance with the local land-use plan. However, property developers can exert strong influences on the content of a plan, contributing to a development-led character as well (European Communities 1999). Planning practice can be strongly influenced through the informal use of formal rules (administrative pragmatism) (Needham 2005). The National Spatial Strategy (*Nota Ruimte*), approved by the Senate in January 2006, indicates a departure from the restrictive planning discourse (Spaans 2006), making a radical break from the centralist tradition in which the national government should determine the built environment in detail. The National Spatial Strategy's dictum is to "decentralise if possible, centralise if necessary", in contrast to the centralist path followed by its predecessor, the Fifth Memorandum on Spatial Planning. This change constituted a significant shift in governmental control (Vink and Van der Burg 2006), and according to Zonneveld (2005), the National Spatial Strategy was an important withdrawal from traditional Dutch spatial policy, outlining a new division of responsibilities in a three-tiered government.

As a result, central government has taken a step back, allocating key powers in development control to local authorities, particularly in the provinces. Vink and van der Burg (2006) contend that in this way, development is better supported and that the strategy "seeks to tie in with social trends, rather than combating them". In doing so, the objectives, policy concepts and basic principles from previous strategies are retained (Ministry of Housing, Spatial Planning and the Environment 2006). The document also signals a pivotal shift "from planning to development", which will lessen planning control (Ministry of Housing, Spatial Planning and the Environment 2006).

According to Vink and van der Burg (2006), the National Spatial Strategy strengthens the role of the provinces and reduces the number of rules and regulations set by the central government while creating more scope for local and regional governments, social organisations, private actors and the public in the planning process. However, the National Spatial Strategy also introduces stronger national and provincial powers by allowing national and provincial governments to intervene forcefully when national or international interests are at stake (e.g. biodiversity, national landscapes). In this sense, there may be room for resilience in the new

approaches of the Dutch planning system, since it is becoming more flexible, while still maintaining control in relevant areas such as the environment (Taşan-Kok and Stead 2010).

6.4   Is *Resilience Thinking* Embedded Within National Planning Systems?

The very nature of urban planning is to effectively adjust an ever-evolving reality – human activities in territory and time – to future goals. Therefore, it would be almost pleonastic to say that planning involves the main purpose of dealing with change, and by that it is acknowledged that a resilient thinking is already embedded per se in urban planning. While examining these four national systems in order to identify styles behind them, it was observed that some of the planning models tended to be more efficient, with regard to the increase of resilience, than others. And further, that resilience would be easier to be accomplished in mixed-style systems, when various factors were combined favouring a certain degree, for instance, of redundancy (e.g. in procedural actions and different levels of planning).

Although planning systems hold their own strengths and weaknesses, they are designed to deal with situations of crisis, risks and disturbances within their own fields of application. However, it is recognised that some approaches are more mature than others, which enables a more efficient response to unexpected occurrences, resulting in increasing degrees of resilience in urban planning.

Whenever supported by a well-adjusted governance system, the *comprehensive integrated approach* may decisively promote an efficient response to any disturbance, since it is considered as the most flexible (ESPON 2007), still not in an exclusive way as flexibility exists as well in the other styles of planning in different degrees of efficiency (Newman and Thornley 1996; ESPON 2007). Its most interesting characteristic consists of holding a structure based in lines of action and non-abiding strategies, which ensures the implementation of wide-ranging guidance outlines onto local planning. These local plans tend to implicate different actors, including local communities and stakeholders, which allows a bottom-up approach while more classical top-down guidelines may be followed as well.

As an alternative, the *urbanism tradition*, coherently allows implementing mitigation and adjustment strategies with great accuracy to the place. As in any other stylistic option, technical capacity, up-to-date and transdisciplinary skills, together with public participatory tools, would instigate a more pliable process (see, e.g. COM 2008) fostering for a stronger link between specific urban and landscape design and the community. This approach goes further in finding solutions than the typical vulnerability analysis approach. *Urbanism tradition* might also be especially relevant in promoting polycentric structures, consolidating pre-existent urban centres or even in the dissemination of an urban green economy, by increasing the use of green infrastructures and social innovation (EU 2007; UNEP 2011).

For territorial cohesion, one of the most important aims of the EU, the regional economic planning approach is certainly essential (COM 2008). Since mitigating territorial disparities is one of its characteristics, actions under its scope contribute to equity in distribution of financial, cultural and social resources. It also provides a positive input to local structures (Newman and Thornley 1996). In fact, a well-prepared and resourceful community is more resilient (Adger 2003; Walker et al. 2004).

Land-use management is less capable of responding to certain community challenges, since it is closely linked to the designation of land uses and their development. However, should it be implemented in conjunction with clear governance guidelines and monitored by high standard of technical capacity, it may overcome difficulties in preserving areas which are more vulnerable to risks, preventing private interests to overlap public interests.

As implicit in these four examples (Portugal, Turkey, Sweden, the Netherlands), planning styles are mostly applied in combined forms. This integration results as a plus-value in the urban management towards the increase of resilience. Nevertheless, each system must be based in adjustable governance structures, closely supported by skills of transdisciplinary in their technical teams, strong enough to hold on to a holistic attitude both to the territory and to the planning and management options.

6.5 Final Remarks

Following a number of informal EU meetings between the ministers responsible for the spatial planning of each state, several agreements regarding urban planning have been signed. Among these are such documents such as the ESDP (EC 1999) and the *Leipzig Charter on Sustainable European Cities* (EU 2007), focusing on sustainability, polycentricism and the development of knowledge infrastructures. As these concerns often lead to joint actions, as time goes by national planning tools tend to incorporate these features into their objectives and aims.

More recently, *Lisbon Strategy*'s documents, e.g. the *Green paper on territorial cohesion* (SEC 2008), have been addressing topics such as competitiveness, which in a way may be seen as a precursor of a shift from a more strategic planning vision to a new variety of *territorialism,* in which integrated systems are considered relevant to the various levels.

Since planning is about space, a territorial body should be seen as pivotal, where planning actions should be multilevel, flexible and provide for urban and environmental flexibility in the face of imminent change or risk. In this sense, Europe tends to develop planning skills that are able to cope and adjust to change and risk, contributing to an increase of *resilience* in policies and instruments.

In addition, sustainability concerns have resulted in calls for the sensible use of natural and cultural resources, and accordingly several dissuasive measures, such as the promotion of public transport networks and mixed land use or the reuse of obsolete urban areas, have been developed (European Communities 1999; EU 2007).

These measures are correlated, with the intention being to achieve territorial cohesion, to foster diversity and to allow for the development of specific strategies. Approaches such as innovation centres, urban regeneration and strong investments in R&D lead progressively to strong connections with knowledge networks, which may reinforce the development of knowledge-based, and even creative, economies (SEC 2005, 2008).

Furthermore, *resilience thinking* may be considered as a means of overcoming previous concerns, as it focuses mostly on the capacity of adjustment to disturbances or, in a positive way, *change*. This concept, when applied to urban planning and policies, combines various dimensions and issues, including governance, economy, the environment and society, which, either individually or all together, should lead to the development of specific forms of space production, territorial configurations and the development of cities.

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Chapter 7
Managing Urban Change in Five European Urban Agglomerations: Key Policy Documents and Institutional Frameworks

Peter Schmitt

7.1 Introduction

This chapter focuses on the thematic scope and approaches to urban and regional policy in the five case study cities of Lisbon, Oporto, Istanbul, Stockholm and Rotterdam, while the spatial dynamics and vulnerabilities of each case are explored in Chap. 5.[1] For each of these large urban agglomerations, a number of key documents are introduced and evaluated to provide an understanding of their approach to managing urban change, and an examination is made of their operating institutional framework as regards planning and policy in urban management. These documents constitute key elements of the formal planning systems (e.g. municipal urban development plans or regional comprehensive plans). In addition to spatial plans, a number of other strategic documents that have a clear impact on the management of urban change are identified that complement the spatial plans in various ways. As the intention in this chapter is only to provide an overview, the analysis is restricted to the most important among them.

To start with the notion of urban resilience is not explicitly addressed in the assessed policy documents. As the synthesis presented below is based on a textual analysis, there is a lot of room for speculation on how and to what extent the five urban agglomerations are prepared to follow a more "resilient sensitive" policy approach. In this respect, a more advanced assessment will be provided in the case studies (see Chaps. 9–13).

It is no surprise that in the five urban agglomerations, the key policy documents and their intrinsic messages and intended interventions bear some similarities; however,

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upon closer inspection, significant differences can be identified, since they stem from countries with relatively different planning and governance systems/cultures. While this makes comparisons more complex, it also provides an opportunity to view across a wide spectrum of policy contexts. For this reason, at first a brief overview is presented of the current operating institutional frameworks as regards policy delivery in the field of spatial planning in general and land-use management in particular in the five case study cities, which will help in contextualising the analysed policy documents and their main characteristics. The major strategic concerns, instruments and approaches of these documents are highlighted and discussed in the last section of this chapter, followed by some concluding remarks on the major observations of the study, derived and contextualised in view of the general developments in Europe.

7.2   A Brief Overview of the Institutional Frameworks for Managing Urban Change

In recent years, the influences of "Europeanisation" have become easy to detect, not only on the policies and practices of spatial planning but also on the rules, ideas and emerging discourses (Böhme and Waterhout 2008; Dühr et al. 2010; Jensen and Richardson 2004). Without discussing here the reasons and mechanisms behind the (at least to some extent) observable gradual adjustments, at the city-regional level, however, the strong differences and variations that exist become very tangible when looking at the institutional frameworks related to spatial planning and policies. These are obviously dependent upon national characteristics and trajectories but also by some local specificities, as outlined in the coming sections of this chapter.

7.2.1   Lisbon and Oporto

For the two Portuguese examples, the institutional frameworks for the management of urban change in the two urban regions comprise three distinct levels. At a national level, the Ministry of Environment, Spatial Planning and Regional Development prepares the fundamental planning document, being the National Programme for Spatial Planning Policies (Programa Nacional da Política de Ordenamento do Território, PNPOT). This document defines the major policies for the national territory and sets out a framework for the preparation of lower-order plans, such as the regional spatial plan (plano regional de ordenamento do território, PROT) and the municipal master plan (plano director municipal, PDM).

   The Coordination and Development Commission, such as the one for the Northern Region, prepares the regional spatial plan (PROT), defining a territorial strategy based on national planning guidelines, and provides a framework for the coordination of municipal strategies for local development. Consequently, the municipal spatial plans are developed according to the national and regional strategic

guidelines but also take into account the specific requirements set out in the sectoral plans. This level of planning includes (a) the municipal master plan (PDM), defining the spatial structure for the municipal territory; (b) the urban development plan (plano de urbanização, PU), defining the spatial organisation for part of the municipal territory; and finally, (c) the detailed plan (plano de pormenor, PP), specifying the physical forms, the urban design proposals and the rules for infrastructure projects. Being mainly physical plans, the PDMs can be complemented by a strategic prospective for the municipality territory, which was the case, for instance, for the 1992 Lisbon Strategic Plan, the Lisbon Strategic Vision 2012 and the Strategic Chart for Lisbon 2010/2024. Both the Oporto and Lisbon metropolitan areas were established as new institutional layers in 1991 in response to the expanding urban fabric and its associated challenges.

The officially defined "Metropolitan Area of Oporto" contained nine municipalities in 2005 but has undergone recent enlargement to absorb seven further municipalities and has been renamed as the "Greater Metropolitan Area of Oporto". However, a truly metropolitan government is still absent, and in practice the current informal metropolitan meetings bring together different and, sometimes, competing municipal strategies and interests, meaning that an integrated vision of the whole Greater Metropolitan Area of Oporto is still lacking.

The same can be stated for the Greater Lisbon Metropolitan Area, which can be also considered as a public collective body that is associative in nature, aimed at satisfying the common public interests in the field of strategic spatial planning in the city's 19 municipalities. This organisation has no direct democratic mandate, as its democratic legitimacy comes only from the local authority councillors delegated to the metropolitan council, making it highly responsive to regional development projects (Herschel and Newman 2002: 85) but less involved in metropolitan governance due to the existing institutional labyrinth and overlapping competences that hamper planning processes at a territorial level (Crespo and Cabral 2010: 650).

7.2.2   Istanbul

In Turkey, there is no a specific document directing spatial development at a national level, although there are different central government bodies responsible for planning. The major priorities and principles to be followed in spatial management are defined with respect to economic development in the National Development Plan (*Ulusal Kalkınma Planı*), which is prepared for each 5-year period. The spatial planning system, however, is defined by the Spatial Planning Act of 1985, which sets out different layers of plans and defines which organisations are responsible for their preparation, as well as the rights and responsibilities of different public bodies as regards their implementation. According to this act, the regional plans (*bölge planları*) are the highest level of spatial plan and are prepared in coordination with the State Planning Organisation (and recently by the regional development agencies) and approved by the Regional Policies Directorate of the same institution.

In the Turkish spatial planning hierarchy, the second-layer plan is defined as an Environmental Management and Land-Use Plan, and is prepared and approved by the Ministry of Environment and Forestry, and under specific circumstances, according to the legislation of the Ministry of Public Works. The third layer constitutes local plans, covering both strategic issues in urban development and land-use regulations. These functions are divided between the metropolitan municipality and the lower-level municipalities – the former working with master plans at 1:25,000 and 1:5,000 scales *(Nazım İmar Planı)* and the lower-level municipalities producing implementation plans at a 1:1,000 scale (*Uygulama Imar Plani)*.

Istanbul has an exceptional status within the planning system. When the Istanbul Metropolitan boundary was expanded to coincide with the boundary of the province in 2004, the ministry transferred responsibility for the preparation of the Environmental Management and Land-Use Plan to the Istanbul Metropolitan Municipality. Currently, the Istanbul Metropolitan Municipality is also responsible for the preparation of a master plan for the whole area and for approving the lower-level plans prepared by each "district" or "first-level municipality", besides the Environmental Management and Land-Use Plan. The Istanbul Metropolitan Municipality has a total of 73 lower-tier local authorities within its boundaries, made up of 32 districts and 41 "first-level municipalities". Implementation plans are required to conform to the master plan, and if an authority fails to prepare an implementation plan within a year following the approval of the master plan, the metropolitan municipality has the right to prepare and approve its own plan. The Istanbul Metropolitan Municipal Council is the final decision-making body, made up of the metropolitan mayor and the mayors of the 73 districts and first-level municipalities and 274 further council members from these authorities.

7.2.3   Stockholm

Sweden has a three-tiered administrative system with national, regional (counties) and municipal levels; in spatial planning, however, the municipalities take the leading role. As stated in Chap. 5, there is no national spatial planning policy as such; however, the state has an important role to play in providing major infrastructure (roads, rail, university facilities, etc.) and setting the legal framework for spatial planning (according to the Planning and Building Act of 1987 and the Environmental Code of 1999). Also, at a regional level, there is no formalised legal base for all the counties throughout the country, which is why different regional planning practices exist, one of the most profound ones being in the Stockholm County (herein referred to as the Stockholm region).

In the early 1950s, regional planning became institutionalised in the Stockholm region, which is, due to its comprehensive and explicitly strategic character, an exception in Sweden. Its main instrument, the regional development plan (*regional utvecklingsplan*), has since that time been the guide for municipal planning and as such is rather process-oriented, allowing much room for informal coordination and networking. The Office of Regional Growth, Environment and

Planning (up to January 2011 named the Office of Regional Planning) has the mandate to develop nonbinding regional plans, which are based on several stages of negotiations and participation with all municipalities and other relevant stakeholders in the Stockholm region. The Stockholm County Council is in this sense a designated "Regional Planning Authority", with the "Office of Regional Growth, Environment and Planning" being the main operational organ. The regional development plan is developed in cooperation with the County Administrative Board, which is a state organ that examines, for instance, appeals against municipal planning decisions and building permits. It also retains certain rights of intervention and ensures that national interests and laws are taken into consideration. The regional development plan has to be adopted by the County Council, as the democratic counterweight to the County Administrative Board.

The municipalities – of which there are 26 in the Stockholm region – are obliged to make long-term municipal comprehensive plans (*översiktsplan*), which while not legally binding, form the basis of decisions on the use of land and water areas. It also serves as a guideline for the development of legally binding detailed development plans (*detajlplan*) and building permits. In summary, the municipalities carry the main responsibility for land-use planning in Sweden – which is normally termed as the municipal planning monopoly. Accordingly, no changes to the use of land can take place unless based on a municipal plan. In exceptional cases, the state can decide on changes in the use of land when decisions go against municipal plans (COMMIN 2007).

7.2.4   Rotterdam

Until recently, the central government controlled spatial policy in the Netherlands; however, this task has now been decentralised, allowing provinces to develop policies based on individual needs (Schiess 2007). The publication of the National Spatial Strategy (*Nota Ruimte*) in 2006 shifted responsibility for the development of spatial development strategies to the provinces and municipalities.

The new Spatial Planning Act (Nieuwe WRO 2006) came into force on July 2008, decentralising responsibilities in spatial planning procedures, decision-making and implementation and conferring more responsibility to the provinces and municipalities in the elaboration and implementation of plans. According to the new act, the national government focuses only on the development of, for example, the Randstad and other urban networks; large natural areas of the ecological network (NEN); national parks; main roads and transportation hubs around Schiphol and the Port of Rotterdam; and green ports – regions with many bulbs, flowers, trees, crops and greenhouses (Rijksoverheid 2011). The new act also aims to make the planning procedure less complex and clarifies the responsibilities of the different parties, setting out the mutual relations between the different levels of governance in the process of spatial planning. The amendments that had accumulated in the former act are all integrated into the new act, resulting in a document that is easier to both read and understand. At a national level, the National Spatial Strategy (*Nota Ruimte*),

prepared and issued by the central government, states the government's views and most important objectives in the spatial development of the Netherlands (Nota Ruimte 2006). The *implementation agenda* for the strategy provides insights into the most important spatial investments and implementation activities with respect to the policy. The National Spatial Strategy sets out national spatial policy up until 2020, with long-term aspects covering the 2020–2030 period (Nota Ruimte 2006).

At a national level, a coalition of diverse organisations, including VROM (Ministry of Housing, Spatial Planning and the Environment), V&W (Ministry of Transport, Public Works and Water Management), LNV (Ministry of Agriculture, Nature and Food Quality) and EZ (Ministry of Economy), prepares and issues the National Spatial Strategy. In the new simplified Spatial Planning Act, there are two main types of planning documents: a strategic plan and a legally binding plan. The strategic plan and its general policy are set out in a "structure vision" (*structuurvisie*), whereas the legally binding policy is described in the land-use plan (*bestemmingsplan*). Both the municipalities (*gemeente structuurvisie*) and provinces (*provinciale ruimtelijk structuurvisie*) issue their own "structure visions", and in the case of smaller projects, a project decision (*projectbesluit*) can be made. The "structure vision" replaces the key decisions in spatial planning (*planologische kernbeslissing*, *PKB*) at a national level, in the regional plans at a provincial level (*streekplan*) and in "structure plans" at a municipal level (*bestemmingsplan*).

Local authorities in the Netherlands have extensive responsibilities in such areas as water, rail, road and public transport infrastructure as well as social and community services. The city of Rotterdam itself is divided into 13 sub-city districts (*deelgemeenten*), each with its own administration. These sub-city districts have responsibilities mainly in the fields of administration, local spatial planning and the maintenance of public areas.

7.3   Key Policy Documents on Managing Urban Change and Their Main Characteristics

The key contemporary policy documents for the management of urban change are, first of all, the municipal plans of the five main cities, but also essential are those covering the larger metropolitan area – or the "urban agglomeration" – which vary widely in terms of their spatial scope and thematic focus in the five case study cities. In particular, as regards the two Portuguese urban agglomerations, the interplay with the national level is crucial in this respect; therefore, the National Programme for Spatial Planning Policies has been integrated in the analysis too.

7.3.1   *Lisbon*

There are three recent spatial documents that define the guidelines for the management of urban change in Lisbon, operating at three different levels (see Table 7.1).

Table 7.1 Major strategic concerns, instruments and approaches in the Metropolitan Area of Lisbon

Name of policy document	Major (strategic) concerns	Major decisions/objectives	Major instruments/approaches to implement these objectives	Selected specified major projects
National Programme for Spatial Planning Policies (adopted in 2007)	Territorial cohesion	National strategic orientations, for example, promotion of compact and polycentric cities, qualification of suburban areas, redevelopment of brownfields	Government and regional spatial plans, for example, public sector, regional spatial plans and municipal spatial plans	Construction of new international airport for Lisbon Strengthening the national and international importance of the Lisbon port
Regional Spatial Plan (adopted in 2002, preliminary reviewed version 2011)	Polycentric development, social and territorial cohesion, regional competitiveness, sustainability and equity	Enhancing the metropolitan transport system, developing a polycentric and attractive European metropolis	Municipal government, municipal master plans	Multimodal and intersectoral coordination with logistic platforms, local concentration of functional diversity to decrease car use, consolidation of the ecologic metropolitan network
Lisbon 2020 The Lisbon Strategy (adopted in 2007)	International competitiveness, challenges for territorial governance, social dynamics	Urban revitalisation and waterfront qualification, improving social inclusion	Regional Technological Development Agency, Regional Operational Programme of Lisbon, National urban policy programme (POLIS XXI), regional spatial plan	Socio-urban interventions in deprived areas, rehabilitation of urban heritage areas, implementation of plans for the coastal zone

The National Programme for Spatial Planning Policies is the lead document in the spatial planning system in which Lisbon is embedded (MAOTDR 2007). This not only defines the main options for the national territory and the framework for the preparation of lower-order plans but also provides a platform for dialogue and cooperation with the different member states of the European Union.

The Regional Spatial Plan for Lisbon and Tagus Valley region defines the regional approach, operating in close articulation with the Lisbon 2020 Regional Strategy (CCDR-LVT 2007). The latter document provides guidance for the application of the EU structural and cohesion funds for the region in which the Metropolitan Area of Lisbon is included. The Lisbon 2020 Regional Strategy also suggests some new institutional solutions, in particular in view of local interventions; however, the recently revised Regional Plan for the Metropolitan Area of Lisbon (for which public discussions ended in January 2011), prepared by the Coordination and Development Committee of Lisbon and Tagus Valley, is the leading document in the implementation of a metropolitan vision (see CCDR-LVT 2009). As is the case with many other regional plans in the EU, this is a strategic document that guides the further implementation of spatially relevant policies and projects contained in the municipal master plans. Since this revision occurred simultaneously with several others at a municipal level, the gap that existed between this level and the regional level was somehow overcome, which may be viewed as a positive sign of multilevel coordination.

The recently reviewed Regional Spatial Plan for Lisbon and Tagus Valley (preliminary version of 2011) aims to improve connectivity across the transnational networks (mainly by high-speed trains and a future new airport). This has necessitated a rethinking of the spatial structure of the Metropolitan Area of Lisbon, which the municipalities within the area, but also some of the sectoral stakeholders, consider to be a good opportunity to create or reinforce the urban agglomeration's polycentric territorial layout. Innovative approaches in planning will help to promote urban renewal projects and more mixed land use in specific areas, thus increasing their centralities (see the Alcântara Case Study in Chap. 9).

Currently, the reorganisation and development of the multimodal interfaces, the expansion of the underground network and the creation of an external light railway ring in the Lisbon urban agglomeration indicate a growing level of connectivity that will allow for the development of alternative job centres. In this light, one can say that from the 1990s onwards, the Metropolitan Area of Lisbon has shifted from being a model based on the Fordist functional dichotomy between the centre and periphery to a knowledge-based model characterised by a relatively effective polycentric system. To this end, a number of spatial plans have addressed several concerns, ranging from sustainability to polycentricity, and are thus very much aligned to the strategic spatial approaches advocated in several EU and other international policy documents.

7.3.2 Oporto

Similar to Lisbon, in Oporto one of the key policy documents is the National Programme for Spatial Planning Policies, as it sets out a polycentric perspective not

only for the country as such but also for the larger urban agglomeration of Oporto (Table 7.2) (see also MAOTDR 2007). The regional spatial plan for the "North Region" (CCDR-N 2009) defines a territorial strategy for all 86 municipalities in the NUTS II area "Norte" by defining three different "planning areas": (1) Minho-Lima; (2) Trás-os-Montes e Alto Douro; and (3) Grande Porto, Cávado, Ave, Tâmega and Entre Douro e Vouga. The latter includes the Greater Metropolitan Area of Oporto, for which no explicit key policy document exists as regards the topic at hand.

One of the most relevant examples of strategic planning for this larger region in the north of Portugal is the "NORTE 2015" document: a public initiative that has been carried out by the Coordination and Development Commission for the Northern Region in partnership with the Regional Council (see CCDR-N 2006). This key policy document from 2005 has been the basis for the elaboration of the regional plan of 2009, with the objective being to define a new vision and strategy for the development of the region. This has resulted in a "regional proposal" for the principal priorities and public policy instruments for the 2007–2013 National Strategic Reference Framework.

As regards the urban agglomeration of Oporto, the National Programme for Spatial Planning Policies proposes a polycentric perspective for the northern part of the country to address the current scattered settlement pattern. The basic rationale is to reinforce the dynamics and autonomy of urban areas outside the urban agglomeration of Oporto in order to obtain a more structured land-use pattern.

The regional plan for Oporto translates the objective of this policy option as follows: (a) to strengthen central areas, (b) to promote functional polycentrism, (c) to establish the general principles and common rules for land-use change, (d) to support socio-economic development policies, (e) to provide a framework for the preparation of activity plans in the different municipalities, (f) to identify housing needs, (g) to provide guidance for the development of the main municipal spatial strategies, (h) to articulate and integrate national investments and the different sector interventions and, finally, (i) to find a balance between rural and urban areas. A central motive here is to overcome the weaknesses of the currently dispersed urban pattern by promoting a more polycentric development in order to guarantee better coherence within the regional urban system.

Due to the absence of a spatial plan or a strategic vision for the area of the urban agglomeration of Oporto (referred to here as the Greater Metropolitan Area of Oporto), a thorough analysis can only be provided through an assessment of the land-use proposals of all 16 municipal master plans. It can be seen that the municipalities of the Greater Metropolitan Area of Oporto have defined that 35% of the territory is to be urbanised. To date, 64% of a total of 28,500 ha of urban land has been turned into consolidated urban areas, while the remaining 36% corresponds to urban areas that are still under development. These figures reveal that land that can in fact be urbanised seems to exceed the real needs of this area, which has been hit seriously by shrinkage. In the current preparation of a new wave of municipal master plans, these areas are likely to be reduced, which may lead to a steady consolidation of the existing urban areas (Pinho 2009).

Within the urban agglomeration, different policies are applied at a local level to address specific problems. For example, there are indications that the centre of the

Table 7.2 Major strategic concerns, instruments and approaches in the urban agglomeration of Oporto

Name of policy document	Major (strategic) concerns	Major decisions/objectives	Major instruments/approaches to implement these objectives	Selected specified major projects
National Programme for Spatial Planning Policies (adopted in 2007)	Territorial cohesion	Promotion of compact and polycentric cities, qualification of suburban areas, redevelopment of brownfields	Government and regional spatial plans, for example, public sector, regional spatial plans and municipal spatial plans	High-speed trains
Strategic Document NORTE 2015 (adopted in 2005)	Sustainable growth, improving economic, social and territorial cohesion	Technological improvements of the regional production base, regional competitiveness	"15 action plans" integrated in seven priority areas, establishing informal urban networks	Knowledge centres concentrating on universities, scientific and technological parks, centres of excellence
Regional Spatial Plan (adopted in 2009)	Social and territorial cohesion, regional competitiveness, sustainability and equity	Protection of areas of agricultural and ecological value, transformation of the Northern Region, developing a polycentric metropolitan area	Public actors, National Strategic Reference Framework (NSRF), municipal master plans	Improving the metro and rail network, qualification and development of coastal and river settlements, increasing intra-urban mobility

city of Oporto is experiencing shrinkage, and thus the area has been the focus of local policies promoting urban regeneration and the rehabilitation of the urban fabric. In the more peripheral municipalities, on the other hand, the problems relate to an increasing loss of competitiveness, driven in particular by the recent economic crisis. The regional spatial plan for the North Region, highlighting high rates of unemployment and problematic social conditions in the rural areas, has led to the development of policies focusing on the creation of urban facilities and infrastructures integrated into national and international networks, the comprehensive requalification in critical and peripheral neighbourhoods, the regeneration of abandoned or obsolete areas (usually industrial areas) and the articulation and integration of different interventions to support local socio-economic development.

7.3.3 Istanbul

The Istanbul Metropolitan Municipality was given the responsibility for the creation of the master plans following the Spatial Planning Act of 1985. The metropolitan master plan prepared in 1995 by the City Planning Directorate and approved by the Council of Greater Istanbul Municipality is still the main document, while a new one is currently being prepared. Besides preparing these plans, the Istanbul Metropolitan Municipality also approves the lower-level plans elaborated by each district or first-level municipality.

Istanbul was assigned a different planning status in the 2000s due to its rapid growth in both economic and population terms. After a number of reforms, in 2004 the boundaries of the Istanbul Metropolitan Municipality were redrawn to coincide with those of the province, with the former represented by local government and the latter by the special provincial administration. The territorial incorporation of the Istanbul Metropolitan Municipality and the province has made possible the preparation of a regional plan at this spatial scale. The regional plan for Istanbul, drawn up by the Istanbul Development Agency, was approved in 2010 (Istanbul Kalkınma Ajansı 2010), a few years after the Environmental Management and Land-Use Plan (Istanbul Büyükşehir Belediyesi 2009) was adopted by the General Assembly of Istanbul Metropolitan Municipality in 2006. The latter underwent considerable revision in 2009 in the wake of strong objections from different state-run institutions and NGOs.

The recently adopted regional plan considers Istanbul as an international service centre that is specialised in financial activities (see Table 7.3). It envisions sustainable development by focusing on high-value-added services with a global competitive capacity while enhancing the quality of life of the urban agglomeration's inhabitants and protecting its considerable cultural heritage.

Additionally, the "Istanbul International Financial Centre Strategy Document and Action Plan", developed by the State Planning Organisation and approved by the Higher Planning Council of the central government in 2009, is expected to have a considerable impact on the spatial development of Istanbul in general and the central part in particular, where these financial activities are to be clustered.

Table 7.3 Major strategic concerns, instruments and approaches in the urban agglomeration of Istanbul

Name of policy document	Major (strategic) concerns	Major decisions/objectives	Major instruments to implement these objectives	Selected specified major projects
Istanbul Regional Plan (adopted in 2010)	To enhance the economic structure and quality of life	Increasing competitive capacity of the urban economy	Preparation of action plans	Not clearly defined
Istanbul Master Plan (adopted in 1995)	Maintaining the current urban form, relocation of industry to the fringe, defining new areas to be developed	Retaining the existing CBD with expansion through transformation of former industrial sites to office/commercial functions	Public-private partnerships on real estate development, privatisation of public enterprise with large plots	Two secondary centres are proposed at the far ends of both sides of the urban fabric
Environmental Management and Land-Use Plan (adopted in 2009)	Limitations on urban growth in order to protect water basins and forests	Linear but also compact urban form that extends along the south coast	Renewal and transformation projects, provision of funds to housing projects	48 sites or areas for specific projects
Istanbul International Financial Centre Strategy Document and Action Plan (adopted in 2009)	Enhancement of the financial role of Istanbul	Preparing the financial infrastructure and the metropolitan area to host international financial firms	Developing office space/housing areas in non-earthquake risk areas, improving the transport systems	Allocating land for relocation of banks from Ankara to Istanbul

The regional plan does not propose any particular spatial development strategies but rather accepts the strategies defined by the Environmental Management and Land-Use Plan, approved in 2009. The existing Environmental Management and Land-Use Plan *(Çevre Düzeni Plani)* strives to achieve a linear urban fabric, comprising a more compact urban pattern in general. While the existing CBD retains importance in this plan, the decentralisation of some of service activities to subcentres are suggested due to the physical limitations in further expanding the CBD. This policy document also accepts that the Istanbul Metropolitan Municipality can only accommodate a maximum of 16 million inhabitants, although the latest population projections show a higher population growth rate (i.e. 22 million for 2020). Hence, it has been declared that several growth centres in the nearby provinces should be enhanced in order to attract some of the population from Istanbul.

In the existing master plan for the Istanbul Metropolitan Municipality from 1995, a compact development is accentuated as regards locations for the service sector and industrial activities, also allowing the further expansion of residential areas towards the fringe, which has cleared the way for considerably more urban sprawl in recent years.

Recently, however, new amendments to existing legislations have designated certain areas, some of which are crucial for the metropolitan system, for which the planning and development rights have been assigned to different institutions in the central government (Eraydin 2011). These new amendments to the planning legislation have led to piecemeal planning processes as well as to overlaps of planning decisions in the development and implementation of concrete interventions and projects. Over the last decade, the Istanbul urban agglomeration has become the playground of different authorities and state actors with different interests, agendas and power, resulting in several conflicts between the central and local governments.

In the aforementioned spatial plans, there is strong emphasis on the creation of space for business, especially for financial services. For instance, the "Istanbul International Financial Centre Strategy Document and Action Plan" is targeted to create stocks of office buildings and housing in districts and connect them with different modes of transportation to different parts of the city and the airports.

What is also peculiar for the case of Istanbul is the fact that several central state departments have been increasingly involved in different projects, forming partnerships and taking part in collaborative actions in liaison with the local government. Recently, several projects have been undertaken by the Housing Development Administration, which is attached to the Prime Ministry and has considerable powers in the realisation and financing of different housing projects (renewal, regeneration, conservation, but also new buildings).

7.3.4   Stockholm

In the Stockholm case, there are three key documents to be considered in the management of urban change (Table 7.4). First is the recently adopted regional

Table 7.4 Major strategic concerns, instruments and approaches in the urban agglomeration of Stockholm

Name of policy document	Major (strategic) concerns	Major decisions/objectives	Major instruments/approaches to implement these objectives	Selected specified major projects
Regional Development Plan 2010 (adopted in 2010)	Growing population, maintaining its international competitiveness, climate change, infrastructure capacity, social exclusion	Open and accessible region, good living environment, resource efficiency, promoting a more polycentric regional structure	Information and communication, cooperation with public and private actors	Strengthening eight regional urban cores, public transport and new rail lines, protection of green spaces
Municipal Comprehensive Plan 2010 (adopted in 2010)	Environmental and climate change issues, socio-economic disparities among neighbourhoods, attractive urban environment	Densification and development (also of outer city nodes), better public transportation, investments in parks and public spaces	Information and communication, cooperation with public and private actors	Expanding the inner city beyond its historical borders, modernising the public transport system, buildings in existing neighbourhoods
Vision Stockholm 2030 (adopted in 2007)	(a) A versatile and dynamic city, (b) hub of east central Sweden, (c) hub of a safe, accessible region without social or physical barriers	Achieve better consensus on current and future urban projects	Information and communication	Suggesting new trams and underground routes, as well as new road links/bypasses

development plan, which is a strategic vision that pinpoints some development goals for 2030. The plan is considered to be significantly comprehensive since it covers numerous sectoral and development issues (e.g. energy, environment, transport, economy) (Office of Regional Planning 2010). Due to the relatively monocentric territorial layout of this urban agglomeration, the city of Stockholm plays a key role in managing urban change, with the key document being the new long-term comprehensive plan for the municipality of Stockholm (also adopted in 2010). Finally, a far-reaching programme for the city of Stockholm has to be assessed here too, the so-called Vision Stockholm 2030 (adopted in 2007), which comprises three different visions with regard to sustainable growth and development and will help to provide a frame of reference for urban projects that are either underway or currently only projected (City of Stockholm Executive Office 2007).

With regard to land-use policies, the new regional development plan for the Stockholm region underlines the approach of its forerunner, the regional development plan of 2001, which introduced for the very first time the concept of polycentricity at a regional level. The proposed emerging polycentric shape will be formed out of the eight so-called regional urban cores located 15–40 km from the central core (the city of Stockholm). Such cores shall serve as "territorial anchors" for concentrations of land developments as well as some distinct urban functions in order to promote the intended gradual transformation of the rather monocentric urban configuration into a polycentric one (see Chap. 12).

The major objective of the new Stockholm municipal comprehensive plan of 2010 is to intensify the urban landscape in order to cope with the high demand for office space, hotels and other facilities in the city centre and for housing in the nearby areas and suburbs. At the same time, urban quality and the attractiveness of the city is to be maintained.

The other strategic policy document in Vision Stockholm 2030 puts forward three visions that shall be approached through the application of 21 urban development projects (in such areas as public transport, housing, new work places) that are partly under way in order to communicate a better base for understanding their potential (positive) impacts. Even though this policy document is elaborated by the executive office of the city of Stockholm (and adopted by the city council), the entire document (i.e. the visions and the rather verifying projects) also includes a city-regional perspective, that is, going beyond the municipal boundaries. This is not surprising, since the city of Stockholm is the uncontested hub of this urban agglomeration and may consider the surrounding municipalities as its "natural hinterland". In this respect, the spatial plan also indicates that attempts at further growth are only manageable through mutually consented city-regional projects. One example to illustrate this is the relocation of the harbour from the city of Stockholm to Nynäshamn (around 70 km south of Stockholm), which implies an extension of the current port in the municipality of Nynäshamn on the one hand, and at the same time the construction of attractive and high-end homes and workplaces in the old port areas of Stockholm (as it is the case with the "Norra Djurgårdsstaden" project, as an extension of city to the north-east).

In summary, the strong dynamics caused by urban growth and its potential consequences on land consumption are well reflected in all three policy documents. It is obvious that the pace of growth in the urban agglomeration of Stockholm necessitates a wide regional perspective of land-use development and cooperation beyond administrative borders in order to identify a robust response.

7.3.5   Rotterdam

The City Plan Rotterdam 1992 (Stadsplan Rotterdam 1992), approved by the Rotterdam Municipality (see Table 7.5 for the detailed planning documents), provides an integrated picture of the vision for future sustainable development of the port and the city, with focus on the numerous adverse effects of post-war economic and urban development. A "compact city" objective was introduced with this plan, comprising development along the river and a "carpet metropolis" in the hinterland of the city with the production of parklike residential landscapes. The plan, however, ran into serious financial difficulties after the withdrawal of central government support, meaning that more public/private partnerships and cooperation with adjoining municipalities were needed.

The Rotterdam Spatial Plan 2010 (*Ruimtelijk Plan Rotterdam*) (approved in 2001) was initiated by an interdepartmental working group of the Rotterdam Municipality (spatial planning and urban development and housing departments), which was charged with making an inventory of 180 existing visions, plans or projects in 1999. According to definitions contained in the Spatial Planning Act (*Wet Ruimtelijke Ordening*), it is defined as a structure plan, that is, not statutory binding. The plan establishes diverse framework(s) for initiatives by other actors in the spatial development of the city (governmental, non-governmental and private) (RPR 2010).

The Spatial Plan for the Rotterdam Region 2020 was approved in 2005 by the Rotterdam city region (*Stads Regio Rotterdam*) and the Province of South Holland (see RR 2005). The plan has a "two in one" approach, combining the structure plan for the Rotterdam city region and the provincial spatial plan.

Finally, the Spatial Development Strategy 2030 (Gemeente Rotterdam 2007) was approved in 2007 by the city council. The spatial vision of the plan was of a shared framework, with the belief that such a system facilitates mutual adjustments and leads to a cooperative process in the management of planning as well as investments by the Rotterdam Municipality, adjoining municipalities in the "city region" and the private sector. It also aims at creating a strong post-industrial economy and attractive qualities to bind highly educated and creative workers to the city.

Spatial plans for the urban agglomeration of Rotterdam target the development of a normative core to contribute to a strengthening of its international competitiveness. It places the city of Rotterdam in broader spatial frameworks – mostly as "a vital city within a strong, globally competitive Randstad" – but almost exclusively elaborates its planning in concrete measures (and investments) for locations (clusters, strategic areas, etc.) inside the city, paying little attention to the subject of urban

Table 7.5 Major strategic concerns, instruments and approaches in the urban agglomeration of Rotterdam

Name of policy document	Major (strategic) concerns	Major decisions/objectives	Major instruments/approaches to implement these objectives	Selected specified major projects
Spatial Plan for the Rotterdam Region 2020 (adopted in 2005)	Binding firms and inhabitants to the region.	Better spatial balance of urbanisation (blue–green structures), international competitiveness, high-quality living and working in the city	No explicit policies, leaves room for flexible adjustments, investment programme for infrastructure, PPPs instead of national and local government investments	Six sectoral programmes (e.g. infrastructure, water) and seven area development projects
Rotterdam City Plan (adopted in 1992)	Adverse post-war effects	A "compact city" along the river and the "carpet metropolis" in the hinterland	New types of "concept plans", call for more cooperation in the form of PPPs	New urban renewal projects (e.g. water-front development and new housing sites)
Rotterdam Spatial Plan 2010- RPR 2010 (adopted in 2001)	Regional and international competitiveness	Multicultural and attractive city; major centre of employment, services and residence; European city with a global (sea)port	Set priorities on the local government investment agendas without own budget	Two strategic areas (SAs)
Spatial Development Strategy 2030 (adopted in 2007)	Strong post-industrial economy and attractive city for qualified labour.	10 "core decisions" (e.g. strong economy, with more employment opportunities, attractive residential city with balanced composition of the population)	Spatial development strategy and an implementation strategy	Area development programmes in 13 VIPs (very important projects)

sprawl. Indirectly, it is only housing policy that has a regional perspective in the form of house building schemes and housing distribution systems.

The City Plan Rotterdam 1992 addresses nine integrated assignments, including new projects of urban renewal, with the river as decor (Kop van Zuid), and the development of new housing sites in the north of the city with connections to the river Rotte (including Nesselande – formerly named Achtkamp).

The Rotterdam Spatial Plan 2010 aims in particular at strengthening the city's regional and international competitiveness. In doing so, it focuses on three major ambitions: (a) creating a multicultural and attractive city (in terms of spatial quality) for as many different types of people as possible; (b) becoming a major centre for employment, services and residency in the South Wing; and (c) becoming a European city with a global seaport, as part of a strong Randstad. The plan also suggests two "strategic areas", combining ideals in accessibility, recreation, residential quality, entrepreneurship and water control. Examples of this can be seen in the "City Centre on Two Banks" and the "North Fringe" extensions. In each strategic area, a few "additional guidelines" are emphasised to either new or already existing projects.

The Spatial Plan for the Rotterdam Region 2020 is concerned with the optimal spatial balance of urbanisation (vis-à-vis blue-green structures); international economic development; and quality residential areas, working environments and urban atmosphere. In order to maintain the polycentric territorial layout, the plan defines urban nodes as locations with a high transport accessibility and functional value. The "transport value" is determined by the number of converging modalities (public transport in the form of train, metro, tram, (water) bus and car) as well interconnections between modes, including park-and-ride schemes. The presence of mobility-generating functions, housing and offices determines the "functional value". In an ideal situation, the transport value and the functional value should be in balance.

The Spatial Development Strategy 2030 for the city of Rotterdam explicitly regards the adjoining municipalities in the urban region of Rotterdam as potential sites for green residential areas.

In summary, in the urban agglomeration of Rotterdam, spatial planning is developing towards a new "mindset", characterised (a) by a strategy of cooperation between municipal governments and market parties in which the government assesses opportunities and inspires and assists other parties to participate, providing frameworks for the assessment of the role of each participant through a review of their capabilities, and (b) by a shift from stand-alone projects to area development programmes (i.e. binding other parties sustainably to areas and making them co-responsible for the development and management of the programme).

7.4   Synthesis and Major Observations

A comparison of the five urban agglomerations reveals that the assessed key policy documents in which interventions and policies are outlined for the management of urban change contain similarities in their general approaches but differ quite

considerably in their concrete formulation. This can be explained by their different institutional frameworks (except, of course, in the cases of Oporto and Lisbon), as briefly touched upon in the former sections.

It is no surprise that a common feature of each urban agglomeration is the existence of formalised (often statutory) municipal plans with a rather firm understanding of land-use policies. Upon closer inspection, however, they seem to be quite different in terms of their rigidity to the rules. Moving up to the city-regional level, the differences among the five cases become even more visible, which can be traced back to the fact that (recently also in Istanbul) each of the regional planning regimes has developed rather strategic-indicative spatial plans, with consequently a relatively high degree of freedom as regards their content and the character of their intrinsic policies, instruments and organisational approaches. In addition, the four central national governments and their different levels of intervention into local and regional policies must also be taken into consideration, being very high in the case of Istanbul to almost non-existent in the case of Stockholm, while the other three examples (Rotterdam, Oporto and Lisbon) lying between these two extremes.

What is noteworthy is the existence and variety of other non-compulsory strategic documents, which are either of somewhat visionary in character (e.g. Stockholm, Lisbon and Oporto) or illustrate a more sectoral perspective with a rather limited spatial impact (such as focusing on the development of the port in the case of Rotterdam, a document that has not been assessed here due to the limited space, or on promoting activities to strengthen the city's function as an international financial centre, as in the case of Istanbul). The authors of these documents, that is, those who have developed such strategies, are not necessarily from the public or political sphere of each city region's governance regime, as they may also work for independent organisations established for specific purposes (e.g. development agencies), although often initiated by the respective city council. These and other central (strategic) concerns, decisions and objectives, as well as specific major projects, will be further reflected upon in the five case studies (see Part IV, Chaps. 8–12).

Looking at these central (strategic) concerns, decisions more closely and objectives, as well as specific major projects, it should be emphasised that the analysed content was (at least to some extent) selected in view of the particular case studies (cf. Chaps. 9–13). However, disregarding this, one can at least read the following trends.

Unsurprisingly, a common feature is that most of the key documents are not only concerned with land-use management in terms of zoning and protection (i.e. rather "preventive" in character) but also pinpoint options of how to boost the overall economic competitiveness in some specific local hot spots (i.e. rather "developmental" in character). Some of the commonly used buzz words are, in this respect, centres or hubs of excellence/technology/innovation etc., with different sectoral variations.

A common feature of the planning goals of three of the urban agglomerations (Lisbon, Oporto and Stockholm) is their quest for a reconfiguration of their metropolitan areas from a monocentric territorial layout to a "more" polycentric one, which is a trend that can be seen also in other European urban agglomerations (see Schmitt 2010). The essential drivers of such a strategic spatial policy approach are intended improvements in the service and connectivity of the public transport system linked

with functional and partly also an aesthetical upgrade of selected areas that shall in this sense become "mixed centres" or "regional urban cores", respectively. In the case of Oporto, this objective is predominantly focused on reshaping the urban fabric to counteract the ongoing perforation of the urban fabric through selective shrinkage in some areas and continued expansion in others. In Stockholm and Lisbon, the idea is to create new centralities within the urban landscape; while in the larger urban agglomeration of Rotterdam, which is considered as polycentric, the focus is rather to maintain the polycentric territorial layout, that is, to make better use of the existing polycentric structure. In this light, the intended improvement of the multimodal connectivity to international transport systems in the Lisbon urban region is to be mentioned too, since it can be assumed that this will not be inconsequential with regard to land-use management and the efforts to create a more polycentric territorial layout.

In regard to the urban agglomeration of Oporto, issues like urban containment, the perforation of the urban landscape as well as brownfield redevelopment and green zone protection are vital, since although the population has been declining for many years, land consumption is still increasing. In contrast to this, the urban region of Stockholm has seen (and will continue to do so in the future) a continuous growth of population, and it is rather striking that no explicit policies have been introduced (neither at the municipal nor regional level) to improve the current model of land-use management. The normative concepts of polycentricity (at the regional level) as well as the intensification strategy (in particular at the municipal level) are two "implicit" approaches in this respect, without, however, definite land-use implications due to the nonbinding character of the concerned policy documents.

In the urban agglomeration of Istanbul, the subject of land-use management is covered in some policy documents; these normative goals, suggesting a wise or even sustainable handling of the scarce land resources, are complemented by those that, for instance, promote large-scale projects or increase office space and housing in risk-free areas. It remains to be seen just how far these objectives, which at first glance may seem contradictory, can be integrated in a sensible manner within such a fast-growing urban agglomeration.

The urban agglomeration of Rotterdam is an example in which land management policies (such as striving to create a "compact city") have become increasingly less important at the expense of policies to boost global competitiveness and the intended transformation of the city from being a space of production to a space of consumption. More concretely, such policies are focused in particular on specific clusters, urban renewal projects or strategic economic areas, and their implementations follow inevitably a more loose coupled type of coordination (i.e. through specific policy instruments, projects and development programmes). It also appears that the spatial-functional integration into the larger Randstad has become less important than its own "city-regional" competitiveness.

As mentioned in the introduction, to what extent the policy documents presented and discussed above are related to the notion of urban resilience is rather difficult to assess, as none make any explicit reference to it. Hence, any further judgement in this respect shall be left to the chapters in which the case studies are presented (see Chaps. 9–13). The above-described widening of the thematic scope (from land-use

management to strategic and, to some extent, sustainable spatial development) and the increasing existence of other indicative strategic documents, however, can be assessed as a – perhaps unintentional – step towards a more "resilient sensitive" policy response in the five case study urban agglomerations.

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Chapter 8
Evaluating Resilience in Planning

Paulo Pinho, Vítor Oliveira, and Ana Martins

8.1 The Evaluation of Planning

The first part of this chapter introduces the theme of planning evaluation from three different perspectives: an assessment of different planning documents, such as policies, programmes, plans and projects (PPPP); an appraisal of planning processes and practices in the implementation of these documents; and finally, an analysis of the actual results of planning activity on territory and society. The second part discusses how resilient thinking in planning can be evaluated by assessing to what extent planning is able to adapt to new conditions in coping with and managing change. This is a rather pertinent issue, in that despite the increasing presence of resilience on the planning agenda, evaluations of resilient-based planning in literature are notably absent. The final part of this chapter proposes a method of evaluation, identifying its main influences and describing in considerable detail each step in the assessment procedure. The method is applied to case studies in Lisbon, Oporto, Istanbul, Stockholm and Rotterdam in Chaps. 9–13, presenting context-based extensions of variegated forms of this methodology.

8.1.1 Evaluating Planning Documents

Planning evaluations first came into use in the 1950s, when the rational paradigm was dominant in planning theory. In the beginning of the second half of the twentieth century, as is still the case today in many different contexts, evaluations of planning

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took the form of ex ante assessments of planning documents. This focus on the preparation stage is one of the most significant differences between the evaluation of planning and the evaluation of social programmes, where the ex ante stage is usually devaluated due to the supposed difficulties within social sciences in providing a reliable forecast (for more on this issue, see Lichfield (2001) and Lichfield and Prat (1998)).

Under the rational paradigm, the decision-maker would, when faced with a specific planning situation, assess all possible courses of action towards a number of established ends, identify and assess the consequences of each course of action adopted and then select the most preferable alternative.

Throughout the second half of the twentieth century, largely bounded by this rational paradigm, many different evaluation methods were proposed, including cost-benefit analysis, planning balance sheet analysis, goals-achievement matrix, multi-criteria evaluation and environmental impact assessment, to name just a few. Comprehensive reviews and systems of classification of ex ante methods of evaluation can be found in Alexander (2006), Lichfield (1996), McAllister (1982) and Söderbaum (1998).

Alexander (2006) proposes a system of classification based on the type of rationality associated with each view of ex ante evaluation: (1) instrumental rationality, corresponding to the logic of choosing the best means to achieve a particular goal; (2) substantive rationality, demanding consideration of the goals themselves, selecting between objectives and assigning priorities; (3) bounded rationality, providing a context for decision-making; (4) strategic rationality, making the decision-maker and other actors interdependent; and, finally, (5) communicative rationality, shifting the focus from decision-making to social interaction. Alexander (2006) associates instrumental rationality with cost-benefit analysis; substantive rationality with planning balance sheet analysis, multi-criteria evaluation and environmental impact assessment; and, finally, communicative rationality with some forms of multi-criteria evaluation and environmental impact assessment.

Lichfield (1996), in reviewing the "evaluation prior to plan implementation", asserts the existence of four different types of methods. This typology is based on the following questions: (1) Does the method relate to inputs or outputs? (2) Are the inputs and outputs measured in quantity or money? (3) Are the criteria for choice expressed by a number, or by a number reflecting a monetary value? and (4) Do they relate to single or multiple sectors of the community? The first group, designated as "outputs only", includes nine methods, such as checklist of criteria, goals/objective achievement, impact assessment and multi-criteria evaluation. The second group, denominated as "inputs only", comprises three methods: unit cost, threshold analysis and costs in use. The third group, designated as "both output and input", includes methods such as cost-benefit analysis/single objective, social cost-benefit analysis/multiple objectives and planning balance sheet analysis. Finally, the fourth group, denominated as "both input and output in greater width", includes evaluation in structure planning, evaluation in inner cities and strategic choice.

McAllister (1982) analyses a set of evaluation methods, namely, cost-benefit analysis, planning balance sheet analysis, goals-achievement matrix, energy analysis

and land suitability analysis, identifying their main differences and similarities. He sustains that no single method can be claimed as superior, arguing that planners should have a solid understanding of the strengths and weaknesses of each method and should use them as mechanic uses his toolkit, selecting the most suitable set of techniques to address the problem at hand.

Söderbaum (1998) uses the degree of aggregation to identify three different groups, being highly aggregated methods, intermediate methods and highly disaggregated methods. The highly aggregated methods intend to sum all impacts in terms of a single value. This implies the existence of consensus in society about specific valuation rules. Cost-benefit analysis is a clear example of this group of methods – with focus on the quantitative ratio of benefits and costs. It is essentially a monetary method, even when nonmonetary impacts are considered. Intermediate methods also use a single quantitative indicator to express the overall utility of an alternative, but in this case, the indicator has a composite nature that reflects different dimensions. According to Khakee (2003), while these methods have been in regular use in recent years, they have come up against increasing criticism for not paying sufficient attention to the conflicting values of individuals. Planning balance sheet analyses and certain multi-criteria evaluations can be classified as intermediate methods. Highly disaggregated methods are intrinsically multidimensional; rather than showing the overall value of the plan, they make an assessment of the different impacts with the intention of stimulating interactive discourse, thus facilitating consensus building. The design of these methods adapts in line with the changing contexts, and so not only are the results important but also are the ways in which they arrived at. These methods combine inductive and deductive analysis and make use of quantitative and qualitative information (Khakee 2003). This third set of methods also includes environmental impact assessment.

8.1.2 Evaluating the Implementation of Planning Documents and the Planning Processes

The focus of planning evaluation may not be confined to the content of the document but may also look at what happens to this document throughout the planning process. This view corresponds to a performance view to evaluation. This view follows on from the definition of the planning document as a decision framework, and its performance in fulfilling this role defines its usefulness. It is important to understand if, and under what conditions, the planning document was consulted before making subsequent decisions.

Based on the work of Fudge and Barrett (1981), the Dutch school of planning evaluation has been conducting a continuous research from this perspective (see, e.g. the set of papers gathered in Environment and Planning B: Planning and Design 24[6], introduced by Mastop (1997)). Faludi (2000) and Mastop and Faludi (1997) claim that strategic plans – as opposed to project plans – should provide a frame of reference for operational decisions and do not necessarily have to produce direct

impacts on the physical development process. As such, the evaluation of strategic plans should correspond to a detailed analysis of the decisions and actions of a number of actors that are supposed to receive the plan messages.

Faludi (2006) extends further the performance-based approach to the evaluation of the European Spatial Development Perspective (ESDP). Drawing on the distinction between planning as a technical exercise and as a learning process, the author contrasts the concept of the "application" of plan messages with the traditional concept of plan implementation and presents a method for evaluating the success of the former. In the context of policy implementation analysis, Stame (2008) proposes the concept of "promotion", which is somewhat similar to Faludi's concept of "application". The purpose of applying ideas in such a document as the ESDP is to provide professionals involved in European spatial planning processes with a better knowledge of their working contexts and of the directions to follow.

Rivolin (2008) builds upon the idea of "performance of plans", coming up with the "performance of planning systems" concept. He sustains that the main question is not whether performing strategic plans are preferable to conforming regulative plans, but how the strategic and regulative functions of the planning activity should be differently correlated in a planning system aimed at performance rather than conformance.

8.1.3   Evaluating Planning Results on Territory and Society

Another approach to planning evaluation, the so-called conformance-based approach, considers that planning activity should be object-oriented and should focus on the actual results on the environment. From this standpoint, planning documents, and particularly plans, are considered as guides for future development. One major concern is the implementation of planning documents and, fundamentally, the link between planning documents and the outcomes on the ground.

Following on from the publication of a number of fundamental researches at the end of the 1970s (Alterman and Hill 1978; Calkins 1979) and in the second half of the 1990s (Baer 1997; Talen 1996, 1997), a number of interesting studies on this topic have been produced over the last decade, mainly in the United States, some of which are presented in brief in the following paragraphs.

The Plan Implementation Evaluation (PIE) presented by Laurian et al. (2004) is a conformance-based methodology that relies on an analysis of plans and planning permits and offers a rigorous, quantitative and systematic way of assessing the degree to which land-use plans are implemented. Plan implementation is defined as the degree to which plan policies are implemented through the application of specified development techniques in planning practice and is measured in two aspects: "breadth" and "depth". The Plan Implementation Evaluation method has been applied to six New Zealand plans and to almost 400 land development permits, with particular focus on storm water and urban amenity management. Brody et al. (2006a) examined the spatial pattern of wetland development permits in Florida,

verifying its conformance with the proposals of the local plans. The authors analysed how and where wetlands have developed over a 10-year period, whether wetland permits were clustered in areas designated for high-density development, whether they deviated from the plan's original spatial designation, and whether the quality and content of the original plan related to its degree of implementation. In another paper, Brody et al. (2006b) used the same methodology in order to analyse the effective influence on the territory of five sprawl-reduction planning policies included in local plans.

In 2008, Chapin, Deyle and Baker published two papers on the evaluation of planning policies to reduce exposure to hurricane flooding (Chapin et al. 2008; Deyle et al. 2008). In the former article, a parcel-based GIS method for measuring land-use changes, as the basis for an assessment of the implementation of local land-use policies, is presented; while in the latter, Deyle et al. (2008) explored the relationships between the process of implementation and the quality of the maps and policies of local plans.

8.1.4 Evaluating Planning Activity as a Whole

The evolution of planning theory and practice has been a complex process, comprising the successive proposal and coexistence of different approaches and paradigms – from the survey analysis plan to the rational comprehensive approach and from a decision-centred view of planning to communicative planning. This type of evolutionary process seems to suggest that planning is too complex to be explained in a single paradigm.

In recognition of the complexity and uncertainty of both planning and planning evaluation, a number of integrated approaches have been proposed. Alexander and Faludi's (1989) proposal integrates three views of the planning process with their associated criteria of plan quality – planning as control of the future, as a process of decision-making under conditions of uncertainty and as a middle ground view. These authors propose the policy-plan/programme-implementation-process (PPIP) model, providing five criteria for comprehensive evaluation: conformity, rational process, optimality ex ante, optimality ex post and utilisation. Alexander (2000) proposes a "contingent framework", integrating four different paradigms and various forms of rationality, with each of the complementary paradigms involving different actors undertaking different actions in the various stages of the planning process.

Oliveira and Pinho (2009, 2010a, b) propose the plan-process-results (PPR) as a methodology for evaluating plan implementation, also addressing the more comprehensive planning process in which each plan is incorporated and its contribution to city building. It seeks to provide a better understanding of the functioning of local planning practices, thus contributing to their development and improvement with the inclusion of a strong morphological dimension. It holds three generic dimensions – rationality, conformance and performance – and nine specific criteria, namely, interpretation, relevance, internal coherence, external coherence, participation in plan making and plan implementation, effectiveness, commitment of

resources, direction and plan utilisation. It uses a number of different techniques, such as impact matrices, SWOT analyses and morphogenetic analyses. This methodology was applied to the municipal plans of Lisbon and Oporto.

Altes (2006) compares the conformance-based and performance-based approaches in a case study of the Dutch national urban concentration policies. An application of the former concept reveals that the urban containment policies conform well to the plan. Nevertheless, in the context of the current stagnation in housing production, these policies have not been able to improve the decision-making process. In this sense, the author argues that plans with high conformance do not necessarily perform well.

Berke et al. (2006) explored and compared these conceptions of success in planning in the same way, concluding that plan implementation in New Zealand is weak. If implementation is defined in terms of conformance, plans and planners have an important influence on the implementation success, but if it is defined in terms of performance, plans and planners can be considered as less influential.

8.2   The Evaluation of Resilience Thinking in Planning

Debates on the different dimensions of the resilience concept since its formulation and the main developments in ecology and socioecological systems (Holling 1973, 1996; Scheffer et al. 2001), including the most recent developments in the planning field,[1] have been assigned increasing importance in congresses, for example, the annual conference of the Association of European Schools of Planning, or in scientific journals such as Built Environment, European Planning Studies and Urban Studies, as presented in different parts of this book. This section focuses exclusively on the recent efforts to evaluate resilience, both from a narrow planning perspective to a wider point of view that brings together environmental, societal, economic and governance issues.

In recent years the concept of sustainability has grown to attain a fundamental place in debates on planning evaluation through the steady incorporation of socio-environmental principles into the field (see, e.g. Dovlen and Hilding-Rydevick 2008 and Stenberg 2008); the development of evaluation theory, including normative contexts (Girard 2006; Söderbaum 1998); and the design of methods, techniques and indicators (Lombardi 1998; Bauler et al. 2008). In addition, sustainability assessment has recently emerged as a specific tool in the attainment of sustainability, including a broad range of approaches, such as environmental impact assessment and strategic environmental assessments (see Pope et al. 2004). In the United Kingdom, sustainability appraisals, mandatory since 2004, have been used to promote sustainable development through the integration of social, environmental and economic considerations into the preparation of plan revisions.

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[1] The linkage between ecology and planning has been proposed and developed over the last four decades, from Holling and Goldberg (1971) to Pickett et al. (2008).

The inclusion of resilience thinking in planning evaluation, on the other hand, has been far more modest. As such, the design of the evaluation methodology in this book, with a clear innovative character, required a search for frames of reference in a wider context. The following sections present a number of evaluation frameworks and methodologies, sourced from socio-environmental system literature and from planning literature.

8.2.1 Analysing Resilience in Socioecological Systems

Carpenter et al. (2001) identify three different levels of meaning for resilience – as a metaphor related to sustainability, as a property of dynamic models and, most importantly, as a measurable quantity that can be assessed in field studies of socio-ecological systems. The authors highlight that the assessment of system resilience presupposes the identification of the system configuration and of the disturbances. In their study, the resilience properties of two contrasting systems – lake districts and rangelands – are compared in two case studies.

Walker et al. (2002) present an evolving approach to analysing resilience in socioecological systems, as a basis for resilience management. The authors propose a framework of four steps involving close coordination among the stakeholders of the systems: (1) a stakeholder-led development of a conceptual model of the system; (2) the identification of the range of unpredictable and uncontrollable drivers, stakeholder visions for the future and contrasting possible future policies, weaving these three factors into a limited set of future scenarios; (3) the exploration of the systems for resilience in an iterative way; and, finally, (4) the stakeholder evaluation of the process and outcomes in terms of policy and management implications.

Acknowledging the difficulties faced in operationalising resilience theory and in developing and testing empirical hypotheses, Bennett et al. (2005) present a method in which simple system models are used as a framework for identifying resilience surrogates for case studies. The construction and analysis of simple system models provides a useful basis for guiding and directing the selection of surrogate variables, offering empirical measures of resilience.

In recent years, the Resilience Alliance has led researches on resilience in social-ecological systems. In 2007 this multidisciplinary group prepared two workbooks, one (more comprehensive) for practitioners and the other (more concise) for scientists, to assist in the assessment of resilience in social-ecological systems (Resilience Alliance 2007a, b). These books offer guidelines for the undertaking of evaluations of the resilience of natural resource systems in five parts: (1) a definition of the system under analysis (and of disturbances), (2) an identification of alternate states and thresholds, (3) an evaluation of dynamics based on system cycles, (4) an inquiry into the adaptability of the system and, finally, (5) a guidance for planning interventions.

Tanner et al. (2009) propose an analytical framework that combines governance literature with rapid climate resilience assessments conducted in ten Asian cities. The authors argue that a number of key characteristics can be identified to assess

and build urban resilience to climate change in a way that reduces the vulnerability of citizens at risk from climate shocks and stresses. These characteristics form the basis of a climate-resilient urban governance assessment framework and include (1) decentralisation and autonomy, (2) accountability and transparency, (3) responsiveness and flexibility, (4) participation and inclusion, and, finally, (5) experience and support. This framework can assist in planning, designing and implementing urban climate change resilience-building programmes for the future.

8.2.2   Methodologies for Evaluating Resilience in Planning

As mentioned above, methodologies for the evaluation of resilience in the planning field are not as common as in socioecological systems. Drawing upon previous attempts to evaluate planning sustainability, Nijkamp and Finco (2009) propose a framework, a multi-criteria evaluation method and a set of indicators for the assessment of resilience strategies (considered as a basic condition for the achievement of urban sustainability). With the help of two case studies, the Italian city of Cremona and the Dutch city of Enkhuizen, a typological framework for classifying urban sustainability cases is provided.

Bonnet (2010) proposes a methodology for evaluating the functional resilience of territories and, more particularly, the networks of local firms. The methodology involves the modelling of networks using graph theory, based on data collected from a statistical survey of a sample of firms and a list of shared patents pending. The application of the methodology to the Montpellier urban area in France revealed the existence of pivotal firms within the network that played an important role in the resilience and spatial organisation of the territory.

Stevens et al. (2010) propose a framework for evaluating the ability of planning proposals to create disaster-resilient communities. The framework is applied, using methods such as multiple regression analysis, to a set of 33 developments, including conventional low-density and new urbanist high-density areas located on floodplains to assess which is incorporating a higher percentage of hazard mitigation techniques. The assessment revealed that new urbanist developments performed better, not due to the quality of the proposal but to increased local government technical assistance in the review.

8.3   A Methodology for Evaluating Resilience Thinking in Planning (RTP)

This section presents a new methodology to evaluate resilience thinking in planning (RTP), designed by the CITTA researchers Paulo Pinho, Vítor Oliveira, Sara Santos Cruz, Silvia Sousa and Ana Martins. This methodology draws on work both from the socio-environmental systems (particularly on the research developed by the

Resilience Alliance) and from the field of planning evaluation (particularly on the policy-plan/programme-implementation-process method designed by Alexander and Faludi (1989) and on the plan-process-results methodology, conceived by Oliveira and Pinho (2009)). As the two former methodologies, RTP considers planning activity as a whole, focusing on planning documents, both at preparation and implementation stages, and on their effects on the territory and society. As such, it can be distinguished from the methods presented in Sect. 8.1 exclusively focused on the preparation of planning documents or on their implementation.

One main concern in the design of the methodology was to make it as simple as possible, easily applicable and open to future comparisons. This is particularly important, since the objects of analysis of the methodology, such as policies, programmes, plans and projects, may differ across different case studies. Chaps. 9–13 present an application of the differentiated forms of methodology in five different European cities.

8.3.1 The Assessment Procedure

The methodology for evaluating resilient thinking in planning (RTP) follows seven fundamental stages:

Stage 1: Identification of key territorial issues
Stage 2: Selection of relevant planning documents
Stage 3: Identification of resilience-related policies and measures
Stage 4: Selection of appropriate resilience attributes
Stage 5: Formulation of the evaluation questions
Stage 6: Selection of the dimensions of resilience and corresponding indicators
Stage 7: Synthesis and critical appraisal of the evaluation results

The first stage comprises the identification of the main territorial issues to be taken into consideration and the identification of the changes and transformations that have occurred in the study area, be it the city, metropolitan area or city region. These shall be the key issues to be addressed in the evaluation exercise. These issues stand out from the normal trends of the urban system and as such can be referred to as changes or disturbances, as discussed in different parts of this book. The key issues affecting the territories under analysis can be, for example, declining city centres (see Chap. 9 for the Lisbon case and Chap. 10 for the Oporto case) and rapid urbanisation processes (see Chap. 11 for Istanbul), to name just three.

The second stage of the assessment procedure involves the selection of the main planning documents focusing on the key issues identified in the first stage and, particularly, the identification of the fundamental concerns expressed in these planning documents. The policies and measures explored in the planning documents (selected in stage 2) correspond to the third stage. These policies and measures are the main object of analysis.

The fourth stage of the assessment procedure involves the selection of the policies and measures that can be evaluated under the framework of the resilience concept. Policies and measures are selected according to this concept, identifying how the objectives and the proposed actions might contribute to a more resilient city.

The fifth stage corresponds to the identification of the resilience attributes that are most suited to the specific case under analysis, and to the formulation of the evaluation questions. The perspective of analysis of the resilience concept can be strengthened through the consideration of the most relevant attributes towards achieving sustainable land-use policies. The rationale for the selection of these attributes considers that:

- The attribute must reflect a positive quality ("the more the better").
- The attribute should reflect a dynamic perspective, so that gains and losses can be easily identified.
- The attribute should be able to equally cross four selected dimensions (following the Resilience Alliance 2007c): economic, social, environmental and governance.
- The attribute should be defined so that overlaps are avoided as much as possible.

In practice, the selected attributes can have different weights. For each case study, several attributes are to be considered through an evaluation of selected planning documents (policies, programmes, plans and projects). These attributes, which are discussed in detail in Chap. 3, are recovery, connectivity, capital building, adaptability, robustness, flexibility and transformability. Each attribute should correspond to an evaluation question, with the intention being to explain how that particular attribute will be considered. The corresponding evaluation questions are as follows:

1. *Recovery:* Are the policies, programmes, plans and projects promoting capacity in the territory to respond to and recover from disturbance?
2. *Connectivity:* Are the policies, programmes, plans and projects enabling an interrelated territory, in which the nodes of the network are effectively linked?
3. *Capital building:* Are the policies, programmes, plans and projects under analysis contributing to the build-up of capital (stock), reinforcing in this way the stability and cohesion of the territory?
4. *Adaptability:* Are the policies, programmes, plans and projects enhancing the adaptability of the territory and its capacity to adjust to change in a reactive way?
5. *Robustness:* Are the policies, programmes, plans and projects increasing the robustness of the territory to unforeseen shocks and disturbances?
6. *Flexibility:* Are the policies, programmes, plans and projects enhancing the flexibility of the territory and its capacity to react to change in a proactive way?
7. *Transformability:* Are the policies, programmes, plans and projects contributing to the transformability of the territory and to its ability to innovate and create a new system should the previous become no longer viable?

The sixth stage of the assessment procedure involves the selection of the relevant dimensions of resilience and the measurement of the corresponding indicators in both the formulation and implementation phases of the planning documents. An evaluation of the formulation of the planning documents should provide an

indication of the internal cohesion of the plan, as well as its consistency and coordination with other instruments. The evaluation of the implementation of the planning documents should be able to focus on the transformability of the territory and on planning practice, meaning that whenever possible, both the conformance and performance of policies should be evaluated. Similar to the Resilience Alliance (2007c), the RTP defines four fundamental dimensions: economic (considering both macro and micro components), social (including cultural components), environmental (the natural and built environment) and governance (public and private). An assessment of these dimensions and components involves the use of different indicators at different scales – national, regional and local. Generally speaking, the indicators should be easily measurable and available, quantitative or qualitative, reduced in number and wisely chosen to ensure good representation.

The last stage of the assessment procedure should provide a critical appraisal of the applicability and usefulness of the resilience concept to the case study under analysis with the help of indicators. The evaluation framework should offer sound measurements for assessing whether the resilience concept is useful in understanding the policies, and supplying guidance to address economic, social and environmental changes to enhance sustainability.

8.4 Conclusions

This chapter has argued in favour of a systematic evaluation of resilient thinking in planning, which is an issue that as yet is not fully integrated into current debates in planning. It is suggested here that an evaluation should constitute a cyclical process with a balanced development over time, should focus on the different aspects of planning and should be able to provide principles and guidelines for promoting resilient urban areas.

The results of the application of the methodology – both in the more theoretical or more contextual forms, leading to different emphasis on the territory, the planning framework or the disturbance itself – to each case study should enhance its ability to endure future shocks and disturbances, regardless of the unexpected forms that they may take, and contribute to the theoretical and conceptual development of urban resilience. The following chapters should validate these statements.

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Chapter 9
Assessing Urban Resilience in the Metropolitan Area of Lisbon: The Case of Alcântara

Luís F. Dias, Sofia Morgado, and João Pedro T.A. Costa

9.1 Introduction

This chapter evaluates the aspects of resilience in Alcântara, the selected case study area located on the western side of the city of Lisbon. Its urban fabrics, land uses and functional links to the city and the metropolitan area allow the area to be defined as a nodal zone amid an area of compact urban development.

The key objectives of this chapter are to assess urban resilience in specific contexts and to discuss the results in a broad perspective. The case study area was selected based on the strategies, land-use policies and key planning documents being applied in the metropolitan area, especially those in which *urban resilience* could be relevant.

As it was not always possible to evaluate both the formulation and implementation phases of the plans, the formulation phase and the expected results were evaluated instead or, in other words, the conditions of the site before and after the implementation of the plans. This strategy allowed an outlining of some prospective results and the assessment of multiple policies/measures. By weighing two attributes – *connectivity* and *adaptability* – it was possible to deduce to what extent the plans and respective policies could potentially contribute to urban resilience in the case study. The choice of these attributes was made based upon the identified disturbances, together with the policies/measures contained within the existing plans. The analysis adopts the evaluation framework defined in Chap. 8, with adjustments to take into account local specificities when necessary.

The evaluation of the Alcântara case is expected to illustrate how improvements in infrastructural *connectivity* and the promotion of Alcântara as a metropolitan centrality contributed to an increase in its socio-economic *adaptation* through the introduction of land-use diversity and urban continuities.

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9.2 The Metropolitan Area of Lisbon

The Metropolitan Area of Lisbon (AML) forms part of the *Lisbon and Tagus Valley Region* (RLVT), a medium-sized *metropolitan polarisation region* within the European context (CCDR-LVT 2008). The region contains five NUTS 3 regions[1]: Oeste, Médio Tejo, Lezíria do Tejo, Grande Lisboa and Peninsula de Setúbal, of which Grande Lisboa and Peninsula de Setúbal make up the Metropolitan Area of Lisbon.

As discussed in Chap. 5, Lisbon experienced a process of urban sprawl beginning in the 1980s, resulting in dense housing areas in the suburban areas served by the railway, low-density areas with detached houses close to links with employment centres, and slums in derelict areas bordering infrastructure and industrial areas in the city cores. From the 1990s onwards, however, the Metropolitan Area of Lisbon began to shift from a model based on the Fordist functional dichotomy between the centre and periphery to a knowledge-based model expressed through a polycentric system, which was clearly stated as an objective in several planning documents. Governance topics are also steadily referred in strategy documents (CCDR-LVT 2007) and gave rise to new institutional solutions for a number of local interventions, as was the case in Alcântara.

In recent years, a consistent metropolitan structure has taken shape, combined with a renewal of land-use opportunities. While the industrial and port areas in the central districts became obsolete due to changes in the production and economic structures, new forms of centrality associated with a knowledge-based economy started to emerge. Likewise, the former radial structure started to evolve into a network system of motorways, creating opportunities for new growth areas along the main axes that had been served by the train in earlier periods. As a result, functional complementarities started to develop, especially between different urban centres and the metropolitan centre, which consists of the municipality of Lisbon and the Tagus Estuary.

Consequently, new land uses that had previously existed in the traditional centres began to emerge in the high-connectivity areas and external rings, together with new dense and specialised land uses, such as shopping centres and malls. With the advent of high mobility patterns, the dimmer urban fabrics began to gain central functions, competing with the city of Lisbon, thus shaping a polycentric metropolitan network that at the same time contributed to a shrinkage process in the metropolitan core, especially in the cities of Lisbon and Barreiro (Morgado 2009). These areas have now acquired an outstanding status in the regeneration agendas of national and EU policies (Polis XXI, Urban Regeneration Agencies, NSRF – National Strategic Reference Framework), as well as in the current outlines regarding the revision of regional and municipal plans.

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[1] The *NUTS/Nomenclature of Territorial Units for Statistics* classification is a hierarchical system for dividing up the economic territory of the EU for the purpose of the collection, development and harmonisation of EU regional statistics: socio-economic analyses of the regions. NUTS 1: major socio-economic regions. NUTS 2: basic regions for the application of regional policies. NUTS 3: as small regions for specific diagnoses, http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction.

At a regional level, new strategic planning documents (Lisboa 2020 Regional Strategy) have proposed new institutional solutions, in particular, for local interventions. The latest revision of the regional plan (PROT-AML), promoted with the participation of various municipalities and institutions, aims to address the previous shortage of multilevel actions, which in the past prevented the regional plan from acting efficiently through municipal planning tools. The current key topics addressed in the Metropolitan Area of Lisbon (AML) planning and policy documents include (1) multilevel and cross-scale coordination, (2) an ecologic metropolitan network, (3) an effective metropolitan transport authority and (4) development of polycentricism (CCDR-LVT 2007).

Alcântara represents an important part of the AML as far as urban trends and population dynamics are concerned on the strength of its sensitive location in Lisbon. Throughout history, Lisbon has experienced great cultural diversity (Roman, Muslim and Christian since 1147) and has undergone several erudite urban developments, some of which have been internationally acknowledged (e.g. the eighteenth-century *Baixa Pombalina*). Development began in a small core which is the current downtown area, and now the city has an urban radial outset, complemented by a rural belt that has been subjected to progressive urbanisation. The eastern side of the city, which was previously an industrial area, witnessed a process of regeneration as a result of the World Exhibition in 1998. The western side is mostly taken up by the Monsanto Forest Park and Belém, a waterfront area containing a number of monumental structures (e.g. Jerónimos Monastery).

Alcântara is a pivotal area between the old downtown and Belém. Its status as a former industrial and port area with a particular social structure contributed to shrinkage, which is today being addressed through the "step-by-step" implementation of various projects detailed in the Alcântara Master Plan. Alcântara's potential as a key node in the polycentric metropolitan network has always been acknowledged, and this status has been reinforced with its consideration in the main polycentric system defined in Lisbon's Municipal Master Plan (PDM, recent revision), which is focused around five centralities along the city's Ring railway line (C.M.L 2010) (Fig. 9.1).

In an assessment of this area in terms of resilience, it was hypothesised that by improving the infrastructural *connectivity* of the area, the socio-economic *adaptation* of Alcântara would increase, introducing a new metropolitan centrality with the introduction of land-use diversity, urban continuities and public transport alternatives.

9.3 Alcântara: *Connectivity* and *Adaptability* as the Promoters of Adjustment to Change

Alcântara can be considered as an area in which the deindustrialisation process has not yet been completed. The local population is in decline, due both to the ageing of the population and the relative inability of the area to attract newcomers. In addition, economic and social dynamics are stagnant, further contributing to the definition of the area as being under *shrinkage*.

Fig. 9.1 Metropolitan Area of Lisbon and case study location (Source: FA-UTL 2010)

Alcântara is located in a particularly steep valley along one of Lisbon's former mid-nineteenth-century boundaries (the *First Ring Road*). A canal, tunnelled below street level in the 1940s, used to flow along the valley ending in a muddy lagoon with a tidemill. The lagoon was filled in the late eighteenth century to accommodate one of the first industrial settlements in the city close to the harbour and railway infrastructures. As a result, some of the areas along the river have become subject to flooding, leading to its definition as a flood and seismic risk area.

Functionally, there are several aspects contributing to the uniqueness of Alcântara as a centrality with regard both to the city and to the metropolitan area, particularly the harbour area and the Cascais suburban railway/Ring railway line junction. In recent decades, the last of the industrial units have been abandoned, and a large derelict area has emerged that is in dire need of urban regeneration (C.M.L. 2008), for which several plans have been proposed.

Of these plans, the sectoral ones have seen partial implementation (REFER/ Railway and APL/Port Area Authorities); however, the Alcântara PU, a Development Plan, only recently is expected to be approved, already under the umbrella of the new Lisbon PDM. This plan comprises various proposals with implications on the urban area, including an important environmental and landscape project and "Alcântara XXI", a large real-estate urban development project to be carried out by a public-private partnership (C.M.L. 2008; Manuel Fernandes de Sá. Lda 2010).

The territorial development model for Lisbon sets out three priorities: (1) to strengthen Lisbon's role in the global and national networks, (2) to revitalise the consolidated city and to promote sustainability and (3) to develop urban qualification and public participation. The primary topics with regard to this case study are to rehabilitate heritage areas, to regenerate transitional areas by establishing new land uses and to consolidate small areas of expansion.

In this context, Alcântara has an important role to play at various levels, including (1) the ecological network and the Green Plan for Lisbon, (2) Lisbon's strategy to revitalise its centrality within the metropolitan system and (3) the development of soft mobility (pedestrian and bicycle routes) and public transportation networks by reinforcing multimodality (railways, tramways, buses).

Considering its role in enhancing the connectivity of the Lisbon Metropolitan Area, the planning instruments and respective policies/measures applied to Alcântara are analysed considering an increase of *connectivity* as pivotal in the *adaptive capacity* that further urban interventions might bring to the area.

The *connectivity* attribute was chosen in recognition of importance of improved accessibility for Alcântara, which demands an understanding of how the envisaged modification will affect the plan area. *Adaptability*, on the other hand, was seen as a key attribute in the transformation of the area that could lead to social and urban diversity. Its selection is illustrative of the conjugated processes between the social diversity, the multiplicity of urban fabrics dating from different periods and built for different purposes and the severe shrinkage dynamics.

9.3.1 Connectivity as a Goal from a Polycentric Perspective

Connectivity is not widely accepted in literature as an attribute of resilience, being considered by some authors as paradoxical. It has been argued that connectivity eases communications between systems and is a prerequisite to spatial resilience and ecologic memory (Andersson 2006) in allowing the exchange of information, capital and goods (Cumming et al. 2005). Additionally, it has been argued that should a certain system remain isolated or with few links to other structures, it might be more protected against epidemic catastrophes, economic shocks or other systemic risks. At the same time, this isolation enables the development of local capacity, diversity and innovation oriented towards daily needs (Cumming et al. 2005; Andersson 2006). Cumming et al. (2005) developed a study based in the *connectivity* of an isolated area in the Amazon, where resilience increases whenever endogenous and exogenous factors reach equilibrium and, as a result, a medium level of infrastructural *connectivity*.

However, other authors share a different viewpoint that is more favourable towards the increase of *connectivity* in the context of resilience. Guevara and Laborde (2008), for instance, propose a *connectivity* model between biosphere reserves as a protection increase factor in the long term. Dale (2007) and Brondizio et al. (2009) share also this positive vision of *connectivity* with an application to

adaptive governance. These authors consider *connectivity* not only in its physical sense but also in the realm of social and institutional relationships. Such relationships are fed by resources of knowledge related to the system's dynamics, allowing for the mobilisation of social memory. This process facilitates access to previous experiences and responses to disturbances, easing the adaptation and innovation of solutions when facing difficulties and allowing the creation of platforms that are able to deal with rapid and broad-scale change.

In this sense, taking into account the contribution of land-use policies to the increase of resilience in urban areas, which may also be seen as a final goal of sustainability, it would appear that an increase of *connectivity* in an urban environment that is based on public transport networks implies an increase in urban resilience.

This argument can be deemed valid at various levels, such as in the case of network redundancy, which is fundamental in the event of natural or technological disasters in reducing the possibility of compromise in key connections or even by decreasing the time proximity between institutions, people and goods networks, contributing to a larger diversity of these channels (CSIRO et al. 2007).

In a globalisation context, whenever interventions into the system result from urban conurbations or contiguous urbanisation processes, diversity dynamics, innovation and local capacities are associated with local functional specialisation. These circumstances require high levels of *connectivity* – consistent knowledge networks with proper infrastructural support – to ensure maximum effect.

The evaluation of *connectivity* in Alcântara takes into account the preliminary proposal of the Development Plan (Plano de Urbanização/PU) for the area, which defines a new link between the Cascais railway and the Ring railway lines, together with the planned Alvito Station on the Southern railway line across the Tagus.

Coming to underground connections, two alternatives were considered: an interface of the Yellow Line with the Alcântara-Mar railway station or the creation of a new station between the Yellow and the Red Lines in Fonte Santa (between Campo de Ourique and Alcântara Valley) connected to the Southern railway line (Manuel Fernandes de Sá. Lda 2010).

Both alternatives were considered in the application of the evaluation methodology. As a result, travel times of 10 min were analysed in three different settings: before the intervention (present time); according to solution (I), having the Yellow Line as its terminus in Alcântara-Mar; and to solution (II), at the junction of the Yellow and Red Lines in Fonte Santa.

The underground and railway stations located 10 and 20 min from Alcântara were identified, with 500 m radius[2] buffers joined to the Information Reference Geographical Database (BGRI).[3] These analytic processes allowed for the

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[2] Value considered as acceptable for trips on foot to large-capacity transport stations.

[3] INE – Instituto Nacional de Estatística/National Institute for Statistics. On this basis, the minimum unit is the statistic subsection, which corresponds, most of the time, to an urban block. Statistic subsections hold alphanumeric information sourced from the 2001 Census. Whenever the stations' influence area limits do not coincide with statistics subsections, the resulting values were weighted according to census results for that subsection.
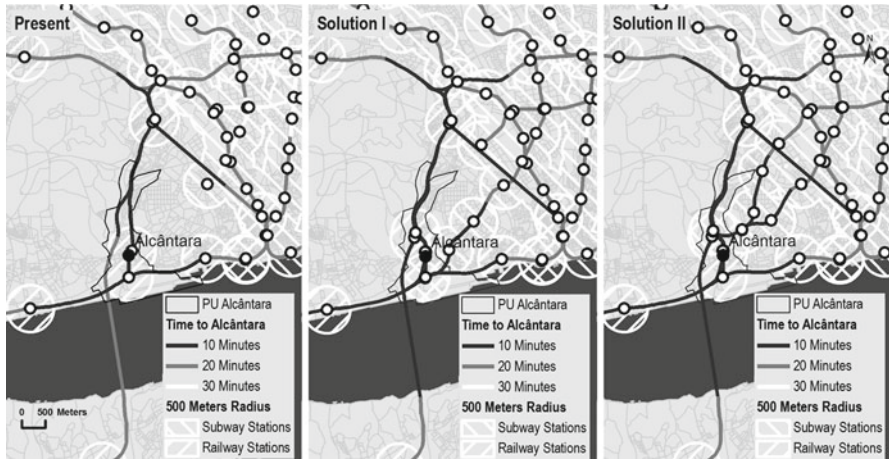
Fig. 9.2 Time travel to Alcântara. Present, solution I and solution II (Source: FA-UTL 2010, with information from CML, INE, REFER, Metropolitano de Lisboa and PU Alcântara)

quantification of several socio-economic indicators regarding the populations located at a given time/distance from the centre of Alcântara from both before and after the intervention, whatever the chosen solution (I or II). Results related to the effects of *connectivity* in the *adaptive capacity* of the Alcântara Plan were obtained (Fig. 9.2).

Connectivity dynamics were assessed using two groups of indicators. These were taken only from the Development Plan perspective, since this is the one that best defines the mobility measures undertaken and the restructuring of the transport networks.

The first group of indicators is based on the policy/measure "increase of centrality/polycentricity" in the light of the social changes that may occur should the Development Plan be implemented. The indicator is defined as the resident population by education level living less than 10 min from Alcântara using the underground or train network within a 500 m radius from the stations. The analysis focused on the area before and after the hypothetical implementation of the plan, aiming to understand the increase of *connectivity* of the educated population level living a certain time/distance from Alcântara. From the results, some positive changes in the demography of residents might be inferred as being a consequence of the expected changes (Table 9.1).

Following a similar strategy of examination, indicators of building functions (divided into residential and non-residential) were obtained for time/distances of 10 and 20 min from Alcântara. The results allow deeper insight into the relationship between the changes of time/distance using public transport, verifying whether Alcântara, with an increased *connectivity*, will have a stronger linkage with other tertiary centres. In this way, economic factors are also factored into the evaluation (Table 9.2).

Table 9.1 Indicators used to evaluate the connectivity attribute in the social dimension and under centrality/polycentricity policy/measures

| Indicators | Phases | | |
| | Before the plan | Expected results | |
	Present	Solution I	Solution II
Inhabitants per square km	5,311	7,098	8,084
Resident population with basic education 1st cycle (%)	34.8	29.9	29.0
Resident population with basic education 2nd cycle (%)	11.9	10.8	10.7
Resident population with basic education 3rd cycle (%)	17.9	18.3	18.6
Resident population with high school education (%)	17.4	19.5	19.9
Resident population with bachelor degree or above (%)	18.0	21.5	21.8

Sources: INE (Instituto Nacional de Estatística/National Institute for Statistics), PU Alcântara (Plano de Urbanizaçao de Alcântara/Alcântara Urban Plan) and FA-UTL (Faculdade de Arquitectura da Universidade Técnica de Lisboa/Faculty of Architecture – Lisbon Technical University)

Table 9.2 Possible outcomes of increasing connectivity under centrality/polycentricity policy/measure

| Indicators | Phases | | |
| | Before the plan | Expected results | |
	Present	Solution I	Solution II
Area at 10 min from Alcântara (km²)	4.01	7.62	8.50
Exclusively residential buildings (per square km)	666	694	773
Mainly residential buildings (per square km)	173	249	226
Mainly non-residential buildings (per square km)	16	33	31
Area at 20 min from Alcântara (Km²)	21.88	32.77	35.22
Exclusively residential buildings (per square km)	613	581	580
Mainly residential buildings (per square km)	231	216	212
Mainly non-residential buildings (per square km)	33	29	27

Sources: INE (Instituto Nacional de Estatística/National Institute for Statistics), PU Alcântara (Plano de Urbanização de Alcântara/Alcântara Urban Plan) and FA-UTL (Faculdade de Arquitectura da Universidade Técnica de Lisboa/Faculty of Architecture – Lisbon Technical University)

9.3.2 Adaptability as an Outcome to Achieve

Despite witnessing a progressive decline, Alcântara can be considered as an urban centre with high potential, given its central location both in Lisbon and in its metropolitan area, and its high level of infrastructure and services.

Throughout the last decade, different research and implementation projects were made in a bid to fight the loss of population and economic potential, with policies aimed at maximising its centrality capacity. This approach has actually become the main goal of the Alcântara Plan, according to the municipal plan of Lisbon (PDM).

Table 9.3 Indicators used to evaluate adaptability attribute in the environmental dimension and under rehousing policy/measure

Indicators		
	Phases	
	Formulation	Implementation
	(1995)	(2004)
Families	≈ 1,200	1,152
Persons	≈ 4,500	3,916

Sources: CML (Câmara Municipal de Lisboa – Lisbon Municipality)/GEBALIS (Gestão dos Bairros Municipais de Lisboa/Management of Municipal Districts of Lisbon)

With the aim of developing a comprehensive outline of the land-use policies that gave rise to the current configuration of the area of the Alcântara Development Plan, other documents were studied, including the municipal Medium-Term Intervention Programme (PIMP) and the National Special Programme for Housing (PER). Despite their different territorial and intervention spheres of focus, both promoted the eradication of the shantytown areas and the respective rehousing of the local population, especially in the Casal Ventoso area.

Another relevant project worth considering is Alcântara XXI, approved in 2005 by the municipal council and revoked in 2008, in which the public realm and housing were considered specifically under an urban regeneration strategy. Great consideration was given to the reconversion of industrial plots in a bid to kick start an economic revitalisation of the area.

The application of the evaluation methodology with regard to resilience includes various programmes and projects (PIMP, PER, Alcântara XXI and the Development Plan) with policies/measures aimed at rehousing, urban regeneration, an increased centrality in the sphere of metropolitan polycentricism.

The evaluation of the attribute *adaptability* is based on a definition of indicators, bearing in mind the policies/measures of urban reconversion and rehousing after the completion of PER, Alcântara XXI and the Development Plan (approved by municipal council in 2010), in which different dimensions and components of resilience are considered.

The first group of indicators focus on policies/measures relating to rehousing, having as a basis the implementation of the PER and PIMP Programmes and factors related to the built environment. The selected indicators from the period before the implementation of the programmes in Alcântara comprised the number of families and inhabitants involved in the Casal Ventoso rehousing process. As for the implementation, consideration was given to the number of new dwellings and, consequently, the number of families and people rehoused under the scope of these programmes (Table 9.3).

The goal of the analysis is to verify the level of coverage of the rehousing programme and the population in the Urban/Urban II Programmes.

The second group of indicators is based on the policies/measure of urban reconversion, seeking to assess the changes resulting from Alcântara XXI and the Development Plan, with consideration of the economic issues raised by the plans.

Fig. 9.3 Changes in building areas in Alcântara (Sources: FA-UTL 2010 (Faculdade de Arquitectura de la Universidad Técnica de Lisboa/Faculty of Architecture – Lisbon Technical University), with information from CML (Câmara Municipal de Lisboa – Lisbon Municipality)/ GEBALIS (Gestão dos Bairros Municipais de Lisboa/Management of Municipal Districts of Lisbon) http://www.gebalis.pt/, (Information obtained from http://www.gebalis.pt/site/html/vale_alcantara.html in 15/07/2010) PU Alcântara (Plano de Urbanizaçao de Alcântara/Alcântara Urban Plan) and Alcântara XXI)

In a way, Alcântara XXI has led to some of the issues covered in the Development Plan. With its approval, certain rights and duties were passed to private sector promoters, which led other private investors with an interest in investing in their own urban plots to request official information from the Municipality of Lisbon (C.M.L. 2006, 2008) (Fig. 9.3).

In this sense, it was important to verify the territorial impact of the expectations of the private sector during the binding period, in spite of the restrictions of Alcântara XXI. This examination aimed to evaluate the level of private sector interest, for which a simple indicator was established that enabled a comparison of the built area from before the project (1997) to near the end of its binding period (2007). Areas that had been subjected to broad demolitions were also quantified in both periods. Within this second group of indicators, but only for the Development Plan, the existing and foreseen built areas were analysed. These areas were subdivided according to use – whether housing, offices, facilities or shopping – so as to allow an understanding of the plan's effects upon the local economy and the prevention of shrinkage (Fig. 9.3; Table 9.4).

The third group of indicators relates to the policies/measures aimed at urban reconversion, drawn from the impact of the Development Plan on the social fabric. The ongoing process of shrinkage can be blamed on various factors; however, the decrease in population can be considered as one of the most important (see Chap. 5 for more details). The implementation of the Development Plan allows an anticipation of demographic change, and for this reason, indicators related to the available projections in the plan were also included (Table 9.5).

Table 9.4 Indicators used to evaluate adaptability attribute in the economic dimension and under urban reconversion policy/measure

Phases	Indicators			Sources
Before the plan	Area of implementation in square metres (1997)		186,751	FA-UTL[a]CML[b]
After the plan	Area of implementation in square metres (2007)		127,850 Maintained	
			58,901 Demolished	
			16,764 New constructions	
Before the plan	Gross area of construction for non-residential uses (2010)		550,730.5 m^2	PU
	Gross area of construction for housing (2010)		423,421.5 m^2	Alcântara[c]
Expected results	–	40% of new gross areas for habitation	60% of new gross areas for habitation	
		m^2	%	m^2	%
	Gross areas of construction for non-residential uses	737,006.5	+33.8	702,665.5	+27.6
	Gross areas of construction for housing	575,356.5	+35.88	609,697.5	+43.99

Sources:
[a]FA-UTL (Faculdade de Arquitectura de la Universidad Técnica de Lisboa/Faculty of Architecture – Lisbon Technical University)
[b]CML (Câmara Municipal de Lisboa – Lisbon Municipality)
[c]PU Alcântara (Plano de Urbanizaçao de Alcântara/Alcântara Urban Plan)

Table 9.5 Indicators used to evaluate adaptability attribute in the social dimension and under urban reconversion policy/measure

Phases	Indicators		Sources
Before the plan	Inhabitants (2001)	8,755	INE[a]
Expected results	Inhabitants – hypotheses 1 (40% of new gross areas for habitation)	11,873	PU
	Inhabitants – hypotheses 2 (60% of new gross areas for habitation)	12,480	Alcântara[b]

Sources:

[a]INE (Instituto Nacional de Estatística/National Institute for Statistics)

[b]PU Alcântara (Plano de Urbanizaçao de Alcântara/Alcântara Urban Plan)

9.4 Main Findings

The redevelopment of the public transport system notably the underground and rail networks will change the connectivity and accessibility levels of Alcântara. Ridership from the underground and train stations located within a 10-min ride of Alcântara will increase as a result of the intervention. As a consequence, the influence area[4] of the stations will increase from 4.01 to 7.62 km^2 or 8.5 km^2, depending on the selected solution. This reduction of time/distance means increased connectivity to Alcântara for the denser areas in the metropolitan realm, with impacts on the population density[5] in surrounding areas of stations within a time/distance of 10 min from Alcântara, which will increase from 5,311 inhab/km^2 to 7,098 inhab/km^2 or even 8,084 inhab/km^2, depending, once again, on the selected solution.

By effectively promoting Alcântara as a central location, and the future availability of services, facilities and shopping areas, a rise in the education levels of the resident population is also envisaged. This may be especially true in a distance/time range of 10 min after the introduction of changes to the public transport networks. Another positive synergy to consider corresponds to a stronger polarisation of services and facilities.

As for the development in the surrounding areas of the stations (within the 10-min time/distance range), the density of buildings or parts of buildings for activities other than housing will increase significantly. This effect corresponds to the reduction of the time needed to travel between Alcântara and the traditional business centre of Lisbon or other important areas, such as the Expo' 98 site (Parque das Nações) or the International Airport. This close proximity and ease of travel between centres will increase the potential of the agglomeration economies.

Within the time range of 20 min to Alcântara, the analysis shows a rather relevant decrease of density following the decrease of activities resulting from a low density, or even lack of buildings, in close proximity to the stations. Future trends may include urban expansion or, oddly enough, urban dispersion.

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[4] Within a 500 m radius.

[5] In Lisbon, the population density in 2001 was 6,673 inhab/km2 (INE 2001).

According to the available data, almost the entire population of Casal Ventoso was rehoused in Alcântara, corresponding to 30% of Alcântara's population (C.M.L 1995), which can be considered as highly relevant from a social perspective. This kind of project presents a considerable challenge in terms of the social insertion of this population, which was supported by the EU Programme Urban II.

At the same time, a strong private initiative was undertaken in the urban reconversion process, which became evident particularly after the approval of Alcântara XXI. Over 58,000 m^2 of buildings were demolished, clearing an area of more than 16,000 m^2 for the construction of new buildings, thus helping to sustain the private sector interest in the reconversion process.

The Development Plan for Alcântara strongly supports new built areas for non-residential use, with two possibilities of occupancy rates (40 or 60% of total new buildings) for the total area. Regardless of the selected solution, both residential and non-residential areas may see a considerable increase in the near future.

In this regard, the growth in area of non-residential activities ranges from 27.6 to 33.8%. Housing will increase from 35.8 to 44%, depending on the chosen solution, corresponding to a demographic estimation rate of 11,873 (+35%) or 12,480 (+42%) inhabitants respectively (Manuel Fernandes de Sá. Lda 2010).

From this it can be deduced that by increasing housing, facilities, shopping centres or service areas, Alcantara's centrality will see a marked increase, bringing together new production factors and inhabitants, allowing for the reversal of the current shrinkage process and promoting intensification within the area.

By providing modern housing, socio-economic diversity levels will also rise, which may have a positive impact both on Alcântara and its surrounding areas in promoting rehabilitation and reconversion processes.

9.5   Conclusions

The process of evaluating resilience in the Metropolitan Area of Lisbon follows a methodology in which the dimensions of resilience, policies and measures, and attributes were examined in a case study of Alcântara. This Alcântara area was chosen due to its particular form of space production and due the existent plans and policies, considered as relevant in the global context of urban planning in Lisbon.

In Alcântara the *adaptive capacity* was analysed for different dimensions of resilience (environment, economic and social) and for different phases of the planning process. The results of the analysis show that Alcântara is undergoing an infrastructural redevelopment process and urban reconversion, with impacts on both the built environment and the social fabrics, both of which have consistently contributed to a shrinkage trend.

Drawing upon the adaptive cycles coined by Holling[6] and Gunderson (2002), it can be said that Alcântara is in the middle of a "renewal or reorganisation" phase,

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[6] The adaptive cycles are the characterisation of a given system in a given time through four sequential states. These states are designated as (1) growth, (2) conservation, (3) release and (4) reorganisation.

and from this perspective, it would seem that the implementation of the Alcântara Development Plan will promote a shift to a phase of "rapid growth".

Supported by a planning process based on previous experiences and solid know-how, this will boost the area's *adaptive capacity* to cope with new challenges (Folke et al. 2002), sustained and potentiated by the intensification of *connectivity* in Alcântara, which will encourage economic changes, social diversity and innovation trends.

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Chapter 10
Evaluating Urban Policies from a Resilience Perspective: The Case of Oporto

Vítor Oliveira, Ana Martins, and Sara Santos Cruz

10.1   Introduction

This chapter presents a case study of the *Baixa District,* located in an urban heritage area in the centre of the city of Oporto in Northern Portugal. The city of Oporto is the centre of its metropolitan area (Metropolitan Area of Oporto – AMP[1]) and the second-largest city in Portugal. It is closely connected to an extremely industrialised area (in the northwest) to which it provides the main services. Links with the eastern hinterland suffer from underdeveloped infrastructures and, for the moment, are mainly geared towards the wine industry. In recent decades, a number of important investments have been made in the metropolitan area with the intention of improving mobility and accessibility, including key infrastructure projects such as the enlargement of the light rail network, new bridges over the Douro River and improvements to the trunk road network. The economic structure of the metropolitan area has evolved over the last half century, changing from "de-ruralisation" in the 1960s to "tertiarisation" starting in early 1980s. Initially, the development models avoided the centre of the metropolitan area, the focus being on the strongly industrialised outskirts. The tertiary sector revealed an accelerated process of growth in the centre of the Metropolitan Area of Oporto (AMP), which has become the centre of a regional productive base, involved simultaneously in both exports and

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[1] Until the year 2000, the Metropolitan Area of Oporto (AMP) encompassed the Oporto municipality as well as eight other municipalities. After a process of enlargement in 2005, this geographical area has become known as Greater Metropolitan Area of Oporto – GAMP. Since 2008, it is formed by a group of 16 municipalities.

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imports. At the same time, the outskirts have become specialised in the supply of consumer products for the international market, being involved in an internationalised system in which footwear and textile/clothing industrial sectors are dominant. Throughout the years, the productive structure of the metropolitan area has been reinforced by the tertiary sector, with the AMP being one of the subregions of the country in which the contributions of the tertiary sector to gross value added (GVA) and regional employment have been the most impressive.

The entire metropolitan area comprises approximately 1.3 million inhabitants, representing 12% of the country's population; Oporto is a relatively medium-sized city, with 263,131 inhabitants according to the Census of 2001. It has a unique location, facing the sea and the Douro River. The old part of the city centre was classified by UNESCO as a World Heritage Site in 1996. Oporto also stands out as a cultural centre in the north of the country, being home to the largest university and the most visited museum of modern art in the country. Despite the reasonable infrastructures, including a good road network, a modern airport and a dynamic seaport, the urban development process has been somehow framed by a double peripheral context: first, when comparing the city (and its metropolitan area) with the capital Lisbon; and second, when comparing Portugal with the most developed countries in the European Union.

This chapter follows the evaluation methodology presented in Chap. 8, beginning by introducing the urban problems of the case study area and by analysing how the main planning documents approach these problems. The policies and measures in these documents are then identified, in particular, those that are able to be evaluated under the framework of the resilience concept. Some attributes were selected as the basis for the evaluation process, in both the formulation and implementation phases of policies/programmes/plans/projects (PPPP). A critical appraisal of the applicability and usefulness of the resilience concept has also been considered in the final section of the chapter.

10.2 The Context: Identification of the Main Urban Problems in the Study Area

Throughout the 1970s and mainly in the 1980s, a process of "tertiarisation" has led to an overall transformation of the city centre, accompanied by a significant decrease in the resident population. In the 1990s, the population decline, the relocation of many services to other parts of the city and to the outskirts, the functional emptying of the historical centre, the degradation of the built heritage and the increasing number of vacant households have had a profound impact on the urban environment. Moreover, in the last decade, the attraction effect of the periphery on housing, business and services has increased, to the detriment of the city centre.

Recently, important demographic changes have been occurring, as the younger and active groups of the population with more economic opportunities search for housing in more attractive areas of the city and in new residential areas with more affordable housing, mainly in the outer areas of the city and in other municipalities.

Those who tend to stay are the older members of the population, and consequently, statistics indicate an ageing of population and a decrease in birth rates. In the last three decades, the loss of population (a drop of approximately 13% from 1991 to 2001) and the ageing process (an ageing index[2] of 1.5 in 2001) have led to an increasing number of vacant dwellings in the centre. Moreover, the old building stock, which in some cases is in a very poor condition (extreme degradation of the buildings), encourages the departure of households with sufficient economic capacity. Low living standards, poverty and unemployment are the most common problems in the area, more specifically in the old historical centre. Under such conditions, urban insecurity and delinquency tend to emerge.

Although some general trends can be identified in the city centre, some differences can still be distinguished between the historical core and the inner ring that constitute this central area. In the historical centre, there is a clear evidence of an ageing of population and lower levels of education and qualification. Families tend to live in rented dwellings that most of the times are overpopulated and below the minimum living standards. The inner ring, although being also characterised by an ageing population, presents better levels of education and qualification than the historical nucleus. The levels of degradation and the abandonment of buildings are, however, significant. In all, approximately half of the buildings are rented, while the other half are owner occupied (Breda-Vázquez et al. 2004).

The *Baixa* District of Oporto is characterised, in general, by a rather compact urban tissue. In fact, a city centre with relatively high densities may benefit from some positive aspects of the compact model and support energy efficiency, mixed use and nonmotorised means of transport in selected streets. Nevertheless, a deeper look at the old core reveals a different scenario. The old medieval core is characterised by narrow streets with extremely dense urban blocks (some of which have historical and cultural significance), adapted to an irregular topography. The high density of some urban blocks has resulted in an urban environment that somehow misses out the positive attributes of the compact model.

The economic decline has had low investment rates in the centre, the displacement of services to other parts of the city and the low economic level of the inhabitants with high unemployment rates have also contributed to a worsening of the situation. In all, it can be said that the recent urban dynamics reflect a worrying phenomenon of urban shrinkage in the city of Oporto.

10.3 Main Land-Use Policies in the Study Area

The case study area is located in the city centre, corresponding to an area of around 1,000 ha – including eight parishes – comprising the Oporto historical area (classified as a World Heritage Site), the traditional downtown and the surrounding areas that

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[2] The ageing index is the number of individuals in the population aged over 65 divided by the number of individuals aged below 15.

emerged in the eighteenth and the nineteenth centuries. The *Baixa* District was designated as a Critical Area of Urban Recovery and Rehabilitation (ACRRU) in the context of an urban regeneration programme.

The different public interventions/policies prepared and implemented over the years have tackled different issues and problems in the *Baixa* District. In general, the intension has been to promote the rehabilitation of the built environment and encourage urban regeneration, focusing not only on the physical environment but also on social problems, supporting local economic development and promoting the revitalisation of the city centre. At a local level, there are several tools directing planning practice and development control in the study area. The main document is the Municipal Plan (PDM) of 2006, which regulates the occupation and land use in Oporto, as well as the rules for the rehabilitation and revitalisation of the historical centre and the most critical areas of the core of the city. The plan has five main goals: the enhancement of the urban identity of Oporto, the rehabilitation of public spaces and the built environment, the rationalisation of the transport system, the reduction of urban disparities and the revitalisation of the historical centre and central areas.

Besides the traditional (and binding) planning document, being the Municipal Plan (PDM), a significant number of programmes were launched in the 1990s, aiming at reversing the process of demographic and economic decline and the urban deprivation of the area. Of these programmes, some had a stronger focus on the built environment, aiming at the rehabilitation and requalification of urban spaces; two others specifically envisioned a better environment through urban requalification; two more tackled social issues; one targeted commercial development; and another was oriented towards information and communication technologies. As mentioned above, the city of Oporto, and especially its central area, has been experiencing a strong urban decline, highlighting a desperate need for urban renewal and revitalisation projects. In the following sections of this chapter, particular attention is given to those projects that have fostered innovation and sustainability (by counteracting the urban decline), in particular those projects promoted by the urban regeneration company, known as *Porto Vivo* SRU.

10.4   The Urban Regeneration Programme: *Porto Vivo* SRU

In November 2004, the *Porto Vivo* SRU, framed by an exceptional regulatory regime of urban rehabilitation (Law-Decree 104/2004, 7 May), was established as the first Portuguese urban regeneration company (RSRU 2004), with financing sourced from the central government (60%, from the Housing and Urban Renewal Institute) and the local government (40%, from the city council of Oporto).

In April 2005, the *Porto Vivo* SRU presented its *master plan*, which introduced the main strategy for the urban rehabilitation process and served as a guide for good practices that may evolve and improve upon annual plans, contributing in this way to the enhancement of the process. The main goals of the plan are the promotion of

AREA	km²	INHS.	BUILDINGS	DWELLINGS
ACRRU	10,7	81660	18048	46561
ZIP	5	43000	10572	25178
HCENTRE	1,5	13218	3097	7350

ACRRU – CRITICAL AREA OF URBAN RECOVERY AND REHABILITATION

ZIP – PRIORITY INTERVENTION ZONE

HISTORICAL CENTRE – WORLD HERITAGE SITE
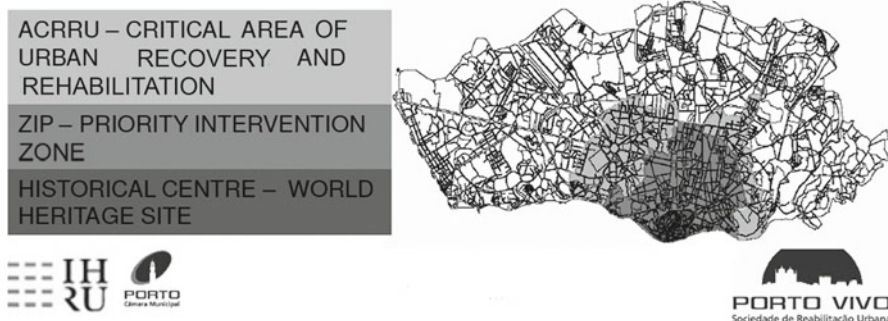
Fig. 10.1 Critical Area of Urban Recovery and Rehabilitation (ACCRU), Priority Intervention Zone (ZIP) and historical centre – World Heritage Site (Source: Porto Vivo 2010)

housing in the central area (by maintaining the existing inhabitants and attracting new residents); the development and promotion of economic activities/businesses; the revitalisation of retail areas; the promotion of tourism, culture and leisure activities; the qualification of public spaces and, finally, the development of certain areas with particular interests, known as Special Action Areas (AAE) (Porto Vivo 2005a). The plan proposes an operational model that encourages the establishment of partnerships through incentive mechanisms; while also defining a number of priority areas, with particular relevance for the Priority Intervention Zone (ZIP) (see Fig. 10.1). Within this zone of 500 ha, two types of areas have been defined, and the works are expected to be completed until 2013: Priority Intervention Areas (AIP), corresponding to different sets of contiguous urban blocks, and Special Action Areas, covering symbolic public spaces and buildings.

In addition, the *Porto Vivo* SRU, together with the city council and urban regeneration companies, is expected to encourage the central government to improve national policies that include legislation related to the improvement of the rental property market, in order to implement taxes that favour urban renewal and revitalisation processes, the regulation of criteria for acquiring derelict buildings, and to promote the dissemination of programmes for financial support.

The urban regeneration process is initiated according to three different possible scenarios: the owner of the building undertakes the rehabilitation works; the owner of the building does not cooperate, and the SRU selects a private partner to substitute him; or the SRU has to undertake the rehabilitation work due to the lack of cooperation of the building owner as well as motivation of the private sector.

After the selection of an urban block within a Priority Intervention Area, a detailed plan, called a Strategic Document, is prepared. The document is structured

in two fundamental parts: a description of the existing situation and a definition of a regeneration strategy. In all, 32 documents have already been approved. Each one estimates a budget and a time frame for the intervention and identifies the main stakeholders from the private sector that may participate in the regeneration of that particular urban block.

The strategic documents contain detailed specifications for the rehabilitation of the buildings and blocks. Besides, the documents also act as dissemination tools, providing a description of all the aspects expected in any intervention into the urban block and gathering information for possible investors, indicating the advantages of investing in this specific area. It also constitutes a basis for public discussion of the proposals, as well as a tool to attract private partners interested in collaborating in the rehabilitation efforts and in partnering with the owners.

These partnerships can be considered as formal cooperation contracts; however, the acquisition of the buildings may be forced should the owner choose not to cooperate. Once the strategic document is ready for implementation, it is considered as representing the will and consensus of the involved parties. The final two steps of a project are the obtaining of a licence from the municipality of Oporto and regular inspections to ensure the regulations outlined in the strategic documents are being followed (Porto Vivo 2005a). Cooperation among the owners of the buildings, the *Porto Vivo* SRU and the investors is extremely important, in that rehabilitation incentives comprise the creation of partnerships with public and/or private entities, such as Partnership for the Technological Downtown, Partnership for Energy Downtown, Partnership for the Social and Economic Downtown, Partnership for the Mobility Downtown and Partnership for Physical Rehabilitation. The fiscal, financial, public incentives and funding programmes are crucial for attracting new investors and to hold the owners' interests. Incentives for rehabilitation include a number of different measures and tools, such as easier access to qualified professionals in the fields of architecture and engineering and to bank credits. Furthermore, *Porto Vivo* SRU and the Oporto Municipality are obliged to provide, in association with the central government, technical support for renewal and municipal or national tax support.

10.5   Evaluation of Policies from a Resilient Perspective

There are a number of relevant policies/measures related to the rehabilitation process that are able to stimulate investment and reinforce the social capital of the area. Some of these measures focus on general urban rehabilitation issues, while others are more associated with the social dimension. For the purpose of this chapter, however, it is the policies that are more closely associated to the resilience concept, that is, that constitute a potential to deal with the identified problems in the study area, which merit particular attention. In this regard, four representative policy measures have been selected, two of which are related to financial issues (financial incentives,

beneficial credit lines), one that is more related to legal issues (facilitating the procedures for expropriation and subdivision, simplified licensing procedures) and the final one related to social issues promoting the attraction of new residents:

1. *Income and corporate tax benefits for new renovation interventions* – encouraging investment and modifying the behaviour of investors and promoters
2. Reduction of municipal taxes on the purchase and renovation of housing – promoting investments for the regeneration of the study area
3. Creation of a special legal regime of urban rehabilitation – shortening planning application procedures
4. *Development of new typologies of housing* – promoting the attraction of new residents

In order to evaluate these policies from a resilient perspective, a set of attributes have been defined, as described in previous chapters of this book. In this particular case study, based on the urban problems identified, two attributes were selected for in-depth analysis.

The first attribute – *recovery* – deals with the physical dimension of the built environment of *Baixa*. In the centre of Oporto, *recovery* is a pertinent concept as the study is focused upon a heritage site that is in urgent need of physical regeneration. As the definition emphasises, recovery is "… the ability of the system to respond and recover from an event. … In an ever changing environment, a system must also change in response to that environment in order to retain its advantage" (Dalziell and McManus 2004:8). This event is, in the present context, considered a disturbance.

The second attribute selected is *capital building*, relating to the social dimension of the urban problems. *Capital building* is an attribute of resilience that may be explored to tackle the vulnerability caused by the main socio-economic issues already referred to above. The concept can be defined as "… those elements in a mature system which make the extended existence of that system possible within its larger context" (Resilience Alliance 2007). As introduced in Chap. 3, social capital building is related to the capacity of the communities for collective action, which requires social continuity as argued in Chap. 5. Robust and organised social relations are important for rapid decision-making and public involvement when needed (Potapchuck et al. 1997). When the community is not able to produce social continuity and collective action, the system is vulnerable to disasters of any kind.

Thus, the purpose of the evaluation of the study area is to conclude whether the process of recovery of the World Heritage Site is able to counteract the social vulnerability of the territory, promoting effective sustainable development and thus leading to a resilient city. This statement comprises the main evaluation question of the analysis, and the following points present the evaluation process undertaken in terms of these two specific dimensions. For each dimension, and attribute, a set of indicators were identified associated to both the formulation and the implementation phase of the programme/plan.

Fig. 10.2 Identification of critical areas within the Priority Zone of Intervention (ZIP). Critical areas due to building conservation, population density and vacant buildings (Source: Porto Vivo 2005a)

10.5.1 The Physical Dimension: Evaluation of the Attribute – Recovery

The policies referred to above indicate an intention to provide favourable conditions in the study area for the promotion and undertaking of a rehabilitation process. As Fig. 10.2 shows, several blocks within the intervention area have been identified as critical areas. The reduction of taxes within the study area aims to encourage investments in urban rehabilitation, either by the owners or by investors, thus increasing the number of buildings rehabilitated and diminishing the level of degradation and the number of vacant dwellings.

In order to evaluate the physical recovery proposed, and already accomplished in some cases, as a result of the interventions associated with the *Porto Vivo* SRU, six indicators were defined for both the formulation and the implementation phase of the programmes, policies, plans and/or projects (Table 10.1).

The study developed in 2004 in the Faculty of Engineering of the University of Oporto/FEUP (Breda-Vázquez et al. 2004) indicates that 45.3% of the buildings in Oporto are in need of rehabilitation, rising to 53.8% in the ACRRU (Critical Area of Urban Recovery and Rehabilitation). The strategic documents of the *Porto Vivo* SRU have defined each of the blocks subjected to intervention, producing several maps with the level of degradation.

The goal of the SRU to rehabilitate all of the buildings highlighted in the ACRRU can be considered unrealistic; thus, the SRU *master plan* has proposed a more realistic figure of 81% of the buildings to be rehabilitated in the Priority Zone of Intervention (ZIP) (Table 10.2).

Table 10.1 Attribute recovery and indicators for the formulation and implementation phase

Attribute of resilience/criteria	Dimensions of resilience	Indicators		Sources
Recovery	Built environment	Formulation of PPPPs	Coverage degree of the PPPP[a]	SRU – master plan
			Degree of rehabilitation[b]	SRU – strategic documents
			Use of new versus existing materials	SRU – strategic documents
		Implementation of PPPPs	Average number of rehabilitated buildings annually[c]	CMP, SRU
			The share of buildings rehabilitated in the priority urban blocks versus the average in the city	SRU
			Rehabilitation rate of progress[d]	SRU

[a]Number of proposed dwellings for rehabilitation versus total number of dwellings in need of rehabilitation in the city
[b]Superficial (e.g. windows) or profound (e.g. structure, roof)
[c]Inside the intervention area, before and after SRU intervention
[d]Number of buildings rehabilitated per year versus total number of buildings in need of rehabilitation

Table 10.2 Coverage degree of the programmes, policies, plans or/and projects

Reference area	Coverage degree of the PPPP in each	Number of proposed buildings for rehabilitation	Number of buildings in need of rehabilitation	Source
Oporto	100%	21,246	21,246	SRU
ACRRU	100%	9,716	9,716	SRU
ZIP	81%	677	832	Strategic documents

The high level of degradation in the intervention area necessitates profound rehabilitation in a significant number of buildings, with almost half of the proposed buildings for rehabilitation in need of important structural works and less than a quarter requiring only superficial rehabilitation, for example, facade rearrangements. Around 53.8% of the 18,048 buildings in ACRRU need being rehabilitated, and almost 5,600 buildings (31%) need profound interventions. In ZIP (Priority Intervention Zone), the strategic documents of the Intervention Units indicate that 47% of the buildings need profound rehabilitation.

The rehabilitation efforts should respect, as far as possible, a certain level of authenticity in building materials in interventions; however, most of those documents (81%) do not mention the materials that should be used.

Due to some inertia at the beginning of the process, the results of the implementation of the programme of SRU fell far short of what was expected in 2009 (Fig. 10.3). Although the legislation dates from 2004, it was 2 years later that the process was actually initiated, following the preparation of the plans, and a period in which investors were sought and the rules and procedures for the interventions were established.

It should be noted that the SRU programme was not the first attempt at rehabilitation in the area. Between 1997 and 2001, focusing particularly on the historic centre of Oporto, the *Commission for the Urban Renovation of the Ribeira/Barredo Area* (CRUARB) achieved a significant number of rehabilitations in the area, as did the Foundation for the Development of the Historic Area of Porto (FDZHP), although the scope of the works of both institutions was never concluded.

Between 2001 and 2009, the number of buildings with low preservation levels decreased. In 2001, more than 50% of the buildings in some parishes that constitute the historic centre of Oporto were in a poor state of repair, but by 2009 this figure had been reduced (Silva 2010).

Paradoxically, the annual average number of rehabilitated buildings has decreased after the establishment of SRU (Table 10.3). As already explained, this is associated with the difficulties inherent in starting such a process, and in the near future, these figures are expected to rise.

The ratio of rehabilitation of buildings per year has been increasing (from 1.4% in 2008 to 2.2% in 2009). In 2009, the ratio of buildings rehabilitated per year in ZIP was higher when compared with the Oporto average; however, these percentages/values can still be considered as extremely low.

The rehabilitation progress has been increasing, from 1.8% of buildings in need of rehabilitation in 2008 to 2.7 in 2009 (Table 10.4). It should be noticed, once again, that although the legislation dates from 2004, it took some time to initiate the
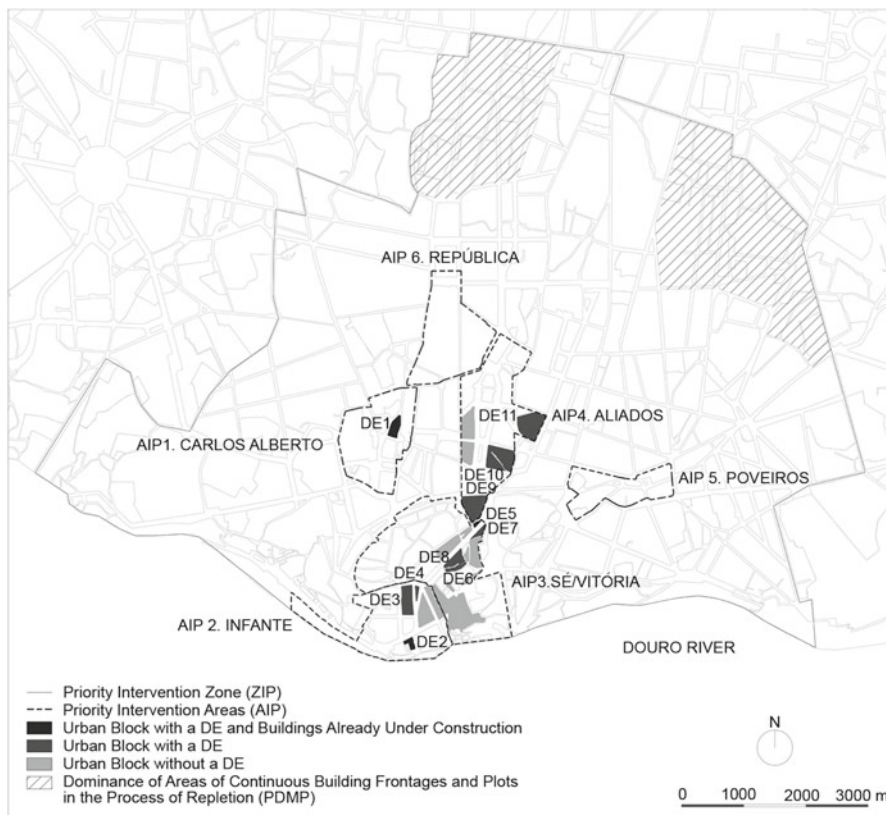
Fig. 10.3 Map of Oporto: location of the Priority Intervention Areas (AIP), urban blocks with/ without strategic documents (DE) (Source: Porto Vivo 2005a)

Table 10.3 Annual average numbers of rehabilitated buildings

Reference area and year	Total number of rehabilitated buildings inside the intervention area, before and after SRU intervention	Annual average of rehabilitated buildings inside the intervention area, before and after SRU intervention
ZIP (1977–2001)	254	10
ZIP (2001–2004)	106	35
ZIP (1977–2004) – before	360	13
ZIP (2005–2009) – after	31	6

process of rehabilitation due to the required formulation of the plan and documents and the time taken to complete the rehabilitation works. The only results worthy of reference appeared after 2008, but it is expected that in the near future, the process will start to show results that are more valuable.

In relation to the attribute of recovery applied to the built environment in the formulation phase, there has been a high percentage of coverage of the plan, a profound level of rehabilitation, and the use of existing materials has not been a main

Table 10.4 Rehabilitation rate of progress

ZIP	Rate of building rehabilitations per year in relation to the number of proposed buildings	Number of rehabilitation of buildings	Total number of buildings in need of rehabilitation	Source
2005	0.0%	0	677	Porto Vivo 2005b; strategic doc
2006	0.1%	1	676	Porto Vivo 2006; strategic doc
2007	0.0%	0	676	Porto Vivo 2007; strategic doc
2008	1.8%	12	676	Porto Vivo 2008; strategic doc
2009	2.7%	18	664	Porto Vivo 2009; strategic doc

concern. In the implementation phase, the annual average number of rehabilitated buildings decreased after the establishment of SRU. However, the rate of buildings rehabilitated in the priority urban blocks seems to be increasing, as well as the rate of progress in rehabilitation. The historical core contains around 1% of newly available dwellings, but in the future this figure is expected to increase.

10.5.2   The Social Dimension: Evaluation of the Attribute – Social Capital Building

The analysis of social issues was a difficult task, because data on existing and new residents was not readily available. In order to evaluate the attribute of social capital building and to characterise the profile of the new residents, surveys had to be conducted. The investigation was inconclusive, due to the low participation of the inhabitants, and so the following description is based mainly either on the area of intervention or in data from the city centre parishes. Through the inquiries, it was, however, possible to identify some social tendencies in the implementation of the policies, plans and policy instruments (Table 10.5).

Oporto has registered a significant decrease in population, especially the *Baixa* District (from 110,672 in 1991 to 84,380 in 2001). This change has mainly been a consequence of people, especially the younger, moving to other parts of the city or to the outskirts, resulting in an ageing of population in the district.

In 2001, around one-third of the resident population of the municipality of Oporto lived in the ACRRU. When analysing the change in population, in the 1991–2001 period, half of the demographic losses in the municipality of Oporto were concentrated in the parishes included in ACRRU.

In the 1990s, there was a loss of 7,000 inhabitants from the historical nucleus (more than one-third of its population), and in the same period, almost 20,000 inhabitants chose to leave the central areas (more than one-fifth of its population). This means that half of the demographic losses of the municipality of Oporto were

Table 10.5 Attribute social capital building and indicators for the formulation and implementation phase

Attributes of resilience/criteria	Dimensions of resilience	Indicators		Sources
Capital building	Social	Formulation of PPPP	Population growth rate	SRU, INE
		Implementation of PPPP	Population growth rate (urban block)	INE, inquiries
			Dependency index	INE, inquiries
			Levels of education	INE, inquiries
			Income disparity	INE, inquiries
			Percentage of inhabitants living on a social support programme	INE, inquiries
			Occupation rate of progress (new inhabitants per year versus total number of expected inhabitants)	INE, inquiries

Sources: INE [National Statistic Institute] (1991, 2001)

concentrated in the inner ring (Breda-Vázquez et al. 2004); however, it should be pointed out that even after the population losses, the population density in the ACRRU is still high when compared to the rest of the metropolitan area, with a population density in 2001 of approximately 10,000 inhabitants per km^2 in the historical centre.

The relationship between younger and older demographics of the population, translated into the total dependency index of 2001, is highly significant in Oporto (CMP 2008). The dependency index (68.7) is significantly higher in the historical centre and the intervention area of SRU when compared to the national average (48.7) (Pinho et al. 2010). The area of intervention is characterised by a high percentage of older people and a low percentage of young and active people, creating a considerable vulnerable area in social terms.

The percentage of retired population in the central areas is also higher than the average for the whole municipality. The weight of this group of population is higher in the historical nucleus, also reflecting an ageing structure of the population. According to the last census (2001), more than 24% of the population of the historic centre of Oporto was over 65 (a number which exceeds the amount of people under 14); the average age of the residents was 43 (in 1991 the average was 38), the percentage of young people was about 20% and the active population represented 64% of the population of the historic centre of Oporto.

The education level of the residents in Oporto in relation to national and regional averages is high. However, the levels of education of the population living in the historical nucleus and in the inner ring are very different. In the historical nucleus the population has a low level of education (52.6% of the population has never studied or has only a primary education); in the inner ring, around a quarter of the population has a degree, which is higher than the average for the municipality.

These different patterns can be ratified through an analysis of the professional structure of the employed population. In the historical nucleus, the population is, clearly, less qualified than in the inner ring.

The indicator "income disparity" (the analysis of incomes, by gender) reveals a slight but positive evolution in 1999–2002 (diminishing from 15.1% to 12.3%). Nevertheless, it continues to present a rather negative scenario in relation to the rest of the country. The figures of 2003 and the inquiries show that the tendency is not evolving in a positive way.

The percentage of inhabitants living with social aid is significantly high, with 9% of the total population living in the city receiving benefits (CMP 2008). These inhabitants, in general, are living in less central areas. The unemployment rate is also higher in the historical area, indicating the social vulnerability of the centre. In comparison with the rest of the city, less than 37% of the population in the historic centre of Oporto depends on income from their work, while 66% of historic centre of Porto residents depend on social aid and not only retirement benefits and pensions (28%) but also subsidies, social integration subsidies, and disability and unemployment benefit (5% of the historic centre of Oporto) (Silva 2010).

In face of such a social scenario, the *Porto Vivo* SRU has proposed, as explained in the presentation of the policies, different types of buildings in order to attract different demographic groups. The low number of rehabilitated buildings and the little information garnered from the inquiries make it difficult to conclude to what extent this policy has accomplished its main objective. In the near future, it is hoped that the blocks designated in different documents undergo a process of rehabilitation so that this critical area of the city can witness a brighter social scenario in the future. Diverse groups of individuals in a society truly contribute to enhancing social resilience in urban areas.

It can be concluded that, in relation to the social capital building in the formulation phase of policies, plans and related measures, there has been a gradual decline of the resident population, while in the implementation phase, there has been an increase in the demand for dwellings in the historical centre, a better balance between young and old people, a maintenance of the weight of the active population, a tendency for the higher educated population to live in the historical centre, a diminishing of the differences in gender incomes and low concentrations of beneficiaries of social aid in the centre of Oporto.

Although there is insufficient data to estimate accurately the occupation rate, there is evidence of increasing interest in the area based on a rise in the demand for housing. The current international financial crisis may, however, affect the goals of *Porto Vivo* SRU or, at minimum, slow down the rehabilitation process.

10.6 Findings and Conclusions

From the analysis of the case study of Oporto *Baixa,* based on the application of the evaluation methodology, it can be seen that the model of urban rehabilitation followed in the SRU programme has some important aspects that are worthy of mention.

The intervention model emphasises the need for the physical rehabilitation of the central area of the city to the detriment of the social dimension, although it combines physical rehabilitation goals with social and economic goals, trying to promote the sustainability of the recovering process.

The attraction of a variety of new residents seems to be not possible, because the re-dynamics of the real estate market targets only the settling of the medium-high/high social classes, given the higher prices of dwellings. A rise in demand leads to a rising in prices, leading to the gentrification of the centre.

There is a tendency for the old-established social classes to move away from the historical centre. This dimension of the revalorisation of buildings also reflects a real devaluation of the immaterial vectors of identity, culture and authenticity, even though the SRU programme intended to bring more opportunities for different social classes to mix by, for example, supplying housing for a variety of new residents, with different typologies, promoting a more welcoming atmosphere, reducing crime and the exclusion phenomenon. The interventions are still very scarce and have been strategically made along some of the structural axes in the historic centre of the city.

The disinvestment problems in the built heritage are created because the SRU model needs to be partially supported by private funds, making public entities mere agents in the regulation of the physical rehabilitation process, due to a lack of public financing for the recovery of buildings; however, *Porto Vivo* SRU/CM Porto, in connection with the state, has the intention to encourage rehabilitation through fiscal and municipal benefits, as well as through governmental funds.

The financial incentives may be considered as only having a weak contribution to the recovery of dwellings, in the case of private interventions by the owners themselves, because, in practice, the owners are asked to invest when, in most cases, they cannot afford to. Only the owners with higher incomes are able to invest.

The model is presented as a partnership between public and private entities, because it is accepted that the making of these partnerships is an important contribution for its implementation. Public bodies lead the process by managing the administrative procedures and by undertaking interventions with the help of some special tools, in particular the expropriation mechanisms. This is one of the best ways to counterbalance the lack of public funds and to attract private investments.

Expropriations made during interventions put the owners under pressure but also provide a guarantee that the rehabilitation process will not be delayed. In this way, the Expropriation Authority can be seen as boosting the real estate market. In some cases, owners sell their buildings to new investors even before the physical rehabilitation is programmed, which may create speculative situations, improving property values.

The urban rehabilitation of *Baixa* is an attempt to improve the dynamics of the real estate market. The recovery of degraded areas through private investments, supported by beneficial administrative procedures and financial incentives, has resulted in a rise in occupation levels. This model of intervention can be understood as being mainly oriented towards stimulating competitiveness and sustainability.

In the centre of Oporto, the problems go beyond the physical dimension, also having a social aspect; however, social problems can only be tackled when all dimensions are considered. Programmes like *Porto Vivo* SRU are making a valuable contribution to integrate the physical regeneration with other dimensions, but the results are still not visible. Only through a combination of the different dimensions can the regeneration of the area be sustained and urban resilience achieved.

The research undertaken in the *Baixa* District of Oporto allowed some preliminary conclusions to be drawn. First, the resilience concept is useful in allowing an understanding of the ongoing urban transformation and for evaluating the urban policies and their economic, social and environmental impacts. In this case, only two dimensions have been focused upon – recovery and social capital building. Second, from a methodological perspective, the resilience concept offers a set of operational tools that enhance the analysis and understanding of the studied cases in relation to natural, built, social and human capital. Third, the attributes of resilience – in our case, recovery and social capital building – can be used as part of a new approach for the integration of a wider analysis that considers ecological, socio-economic and planning perspectives. Finally, urban policies need to be prepared to provide guidance for resilience in dealing with changes and thus enhancing sustainability. Thus, it can be concluded that in the context of a complex evaluation exercise, the concept of resilience constitutes a highly pertinent point of focus and a useful "mindset".

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Chapter 11
The Evaluation of Different Processes of Spatial Development from a Resilience Perspective in Istanbul

Ayda Eraydin, Ali Türel, and Deniz Altay Kaya

11.1 Introduction

There are increasing concerns related to the neoliberalisation of social, economic and political processes, which are pushing the recently introduced spatial policies and new policy instruments in more market-oriented directions, to the detriment of the built environment. In many cities of the world, owing to the complex dynamics associated with the increasing global and local pressures, urban change takes different forms, with important implications on the resilience of cities. Istanbul is one of the best examples of this, where the different types of urban dynamics that can be experienced simultaneously are being illustrated. This makes Istanbul a good study area for defining how the policies and plans adopted to meet the increasing needs and demands can affect a city's resilience.

This chapter aims to evaluate Istanbul's changing urban dynamics, with special emphasis on the policies and plans that have supported urban sprawl and the urban land market dynamics that have intensified the compactness of the urban core, which will be evaluated from the perspective of resilience. The discussion of whether *resilience thinking* allows a new understanding of the policies, plans and practices of Istanbul is based on two case study areas, offering guidance on how the economic, social and environmental changes in Istanbul may be addressed (See Fig. 11.1).

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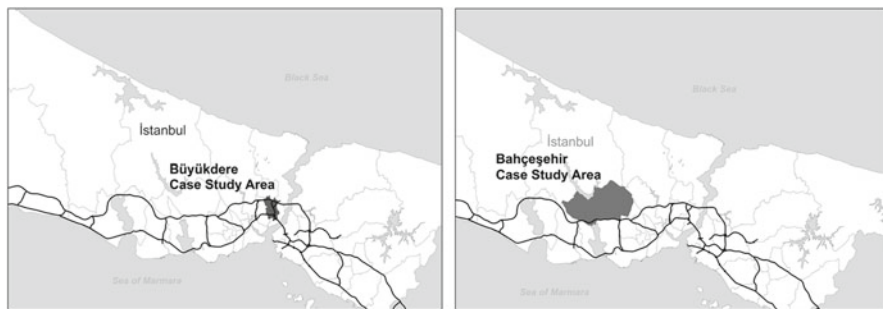
Fig. 11.1 Case study areas

The first case study area, the Büyükdere-Maslak axis, has been the focus of one particular set of inner city intensification policies, plans and projects, with the intention being to transform a former industrial site into a new urban core with global functions. The second case study area, that of Bahçeşehir, offers a good example of how mass housing projects developed for the upper middle-income groups have accelerated the sprawl of the metropolitan area towards the west and north-west.

11.2 The Changing Urban Form of Istanbul: Intensification of Already Built-Up Areas Together with Escalating Urban Sprawl

Istanbul had an almost compact form prior to the 1980s, containing already built-up areas (according to existing land-use plans), surrounded by areas of informal housing. To satisfy the increasing demand for new housing and areas for other activities, the density of the existing planned urban settlements was increased. The 1980s were a turning point for the urban dynamics in the city, with very distinct impacts on the urban form that included the sprawl of the metropolitan area and intensification in the inner core areas. The changes to the urban dynamics were triggered by shifts in the development ideology and the advent of new major economic policies – from the interventionist/protectionist attitudes of the government following Keynesian policies, to an increasing reliance on market forces under the neoliberal agenda.

However, the most important change was the discovery by the government that urban development instruments and projects could be used as a tool for economic development, as well as for sociopolitical regulation, which defined a "new urban regime" in Turkey (Eraydin 2011). As defined in Chaps. 5 and 7, the new urban regime could be considered as the driver of a radical change in the way central and local governments perceived urban areas and the way they handled urban development, namely, through the increasing dominance of the project-based approach. Projects have played a significant role in shaping the urban form in different ways. Firstly,

some projects have caused an intensification of the reuse of land in the inner parts of the metropolitan area leading to an increase in density in the existing built-up areas, although this was not one of the predetermined targets of urban plans or policies. Secondly, urban sprawl was accelerated as a result of several projects, aimed at meeting the rising demand of the rapidly growing population, that were either totally market-led or were launched in collaboration with the state.

11.3   Case Studies

The *Büyükdere-Maslak axis* development is illustrative of how market pressures have become important in shaping urban form, accelerated by the need for new spaces for new functions within the metropolitan area over the last 15 years (Özus 2009). This area, located in the north-west part of the traditional urban core, was designated as a high-income residential area in the 1950s, resulting in the Levent Housing Development Project and the arrival of different types of manufacturing firms, especially those involved in the pharmaceutical and automotive sectors. The most radical change, however, took place after the construction of the first Istanbul bridge in 1973, which increased accessibility from the Asian part of the city and attracted the interest of large enterprises that were in search of new office spaces. While the plans prepared for Istanbul restricted development along this axis and defined a new CBD close to the existing one, under pressure from large capital groups, developments have since been made along the Büyükdere axis, including the headquarters of some of Turkey's largest companies (Tokatli and Erkip 1998). Moreover, the availability of large industrial land parcels has turned this area into just the kind of place being sought by large-scale enterprises; and today, the axis is home to the headquarters of many prestigious banks; holding companies; research and development facilities; advertisement, real estate and insurance offices; shopping malls and hotels. Consequently, the surrounding areas have come under pressure to follow suit (Özus 2009: 624). At present, the zone still hosts some residential and commercial activities that exist in the shadows of the surrounding skyscrapers (Zone 1). Besides this new modern business core, the immediate surrounding areas, which include three zones with different characteristics, are under pressure to restructure: the high-income residential area (Zone 3), an industrial site for SMEs, and the squatter housing neighbourhoods (Zone 2) (Fig. 11.2).

11.3.1   Zones with Different Characteristics and Transformation Potential in the Büyükdere-Maslak Axis

Bahçeşehir, the second case study area, contains one of Istanbul's largest mass housing projects. Initiated and financed by a public bank, the Emlak Bank, in cooperation with private construction firms, it represents a good example of how projects
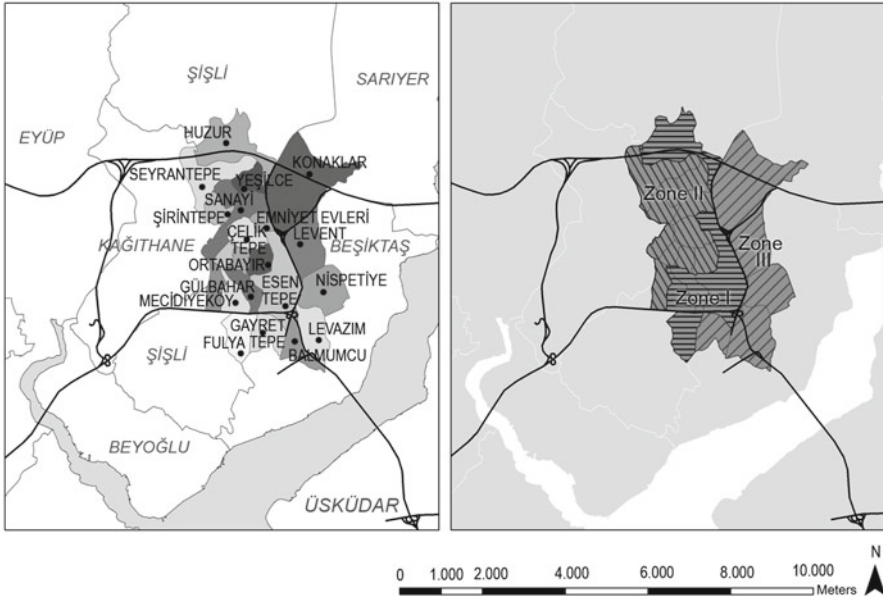
Fig. 11.2 Zones with different characteristics and transformation potential in the Büyükdere-Maslak axis

aimed at providing housing for the increasing population has resulted in increasing the sprawl of this huge metropolitan area and accelerating the invasion of areas of ecological importance. Bahçeşehir is located on the European side of the metropolitan area to the north-west of Küçük Çekmece Lake, 25 km from the metropolitan core. The Bahçeşehir project site, which was formerly farmland, covers an area of around 470 ha (Güvenç and Işık 1999). By 2003, 8,000 housing units had been built, which were home to approximately 24,000 residents; however, the plan was to build 15,500 housing units for approximately 50,000 residents. Bahçeşehir has been the area of choice mainly for middle- and high-income groups, and in fact was promoted as offering a "privileged" and distinct quality of life, distant from all of the negativities of the city, and as a preferable place to live (Kurtuluş 2005: 100–102). The demand for housing in Bahçeşehir was low in the beginning (1994–1995), however, after winning the "Best Practice" award at the Habitat-II Human Settlements Conference in Istanbul in 1996, it became an exemplary model for new developments in Istanbul. The Bahçeşehir project, and similar developments, became synonymous with a new lifestyle and triggered more housing projects and production and business zones in the outer parts of the city. At the same time, the surrounding areas of Bahçeşehir were developed with new projects launched by the State Housing Development Authority and other mass housing projects initiated by private enterprises. The area also features squatter housing districts, residential areas developed by individual owners or developers, a very large industrial site, some rural settlements and a considerable quantity of unplanned land, some of which is still used for agriculture (Fig. 11.3).
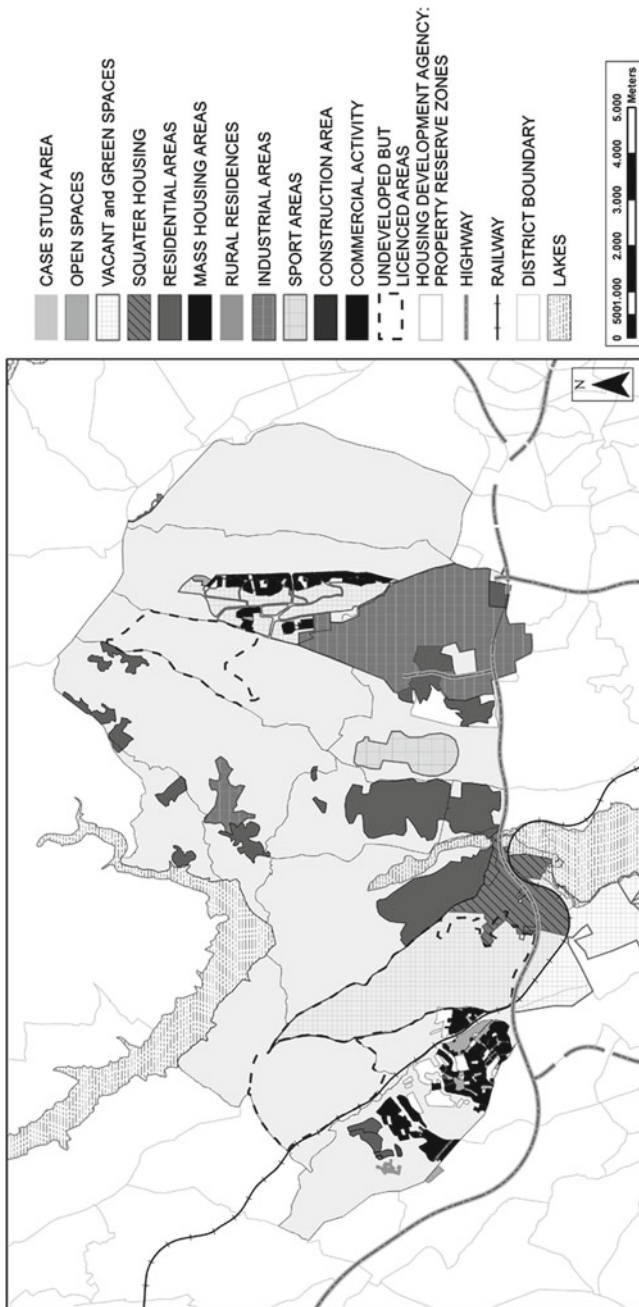
Fig. 11.3 Bahçeşehir Housing Estate and its surroundings

11.4   Methodology

How did these two major projects and similar urban development programmes affect the resilience of this huge metropolitan area? The methodology followed in attempting to answer this question, as described in Chap. 8, comprises six stages. In the first stage of the research, the major disturbances exogenous to the existing urban system were defined, including the changes in the global economy and the impact of new labour and property regimes under the influence of globalisation. The second stage identifies the urban subsystems in which the impact has been significant in Istanbul with respect to three dimensions of resilience, namely economic, social and spatial/ecological. In the third stage, the main territorial issues under threat are identified. These issues stand out from the normal trend of small adjustments to the urban system and are referred to as "changes" or "reactions" to the recently emerging dynamics. A definition of the issues to be evaluated under the framework of resilience is provided in the fourth stage of the study, including a detailed analysis of the most significant changes/reactions that have taken place in the research area, and thus allowing a critical assessment of the existing plans, policies and projects. In the fifth stage, before the final evaluation, the indicators of resilience on selected issues are defined in order to test how far resilience attributes have been taken into account in the different plans, policies and projects. Following the above five steps of analysis, in Stage 6 the findings drawn from the indicators are evaluated with respect to the different dimensions of resilience.

The data required to carry out the evaluation has been collected from different institutions and from questionnaire surveys. Firstly, the data necessary for the identification of indicators was obtained from different public departments, especially the Istanbul Metropolitan Municipality and district municipalities. Second, the maps and plans obtained from different public organisations are analysed with the help of GIS software to create a database of certain indicators. Third, a questionnaire survey was carried out of 250 households in the Büyükdere-Maslak case study area and 100 households in the Bahçeşehir case study area, as well as 50 private firms/enterprises and 50 tradesman and small manufacturing entrepreneurs located along the Büyükdere-Maslak axis.

11.5   Findings

The findings on the two case study areas are organised in such a way that the reaction of the urban system to major disturbances/impacts can be easily understood, while the outcomes are measured with the help of indicators.

11.5.1   Büyükdere-Maslak Axis

As discussed earlier, the Büyükdere-Maslak area is still undergoing a process of transformation. The most significant changes are taking place along Büyükdere Avenue, which now contains many high-rise buildings (90 buildings of more than

Table 11.1 The land-use pattern and transformation areas in the Büyükdere-Maslak axis case study area

Land use	Size of area (ha)	% of total
Potential redevelopment areas	16	1.09
Intensified residential areas	54.4	3.71
New developments	104	7.09
Former squatter areas (limited transformation)	336.6	22.93
Existing residential (limited transformation)	391.6	26.68
Transformed into central business activities	152.3	10.38
Industrial areas	93.8	6.39
Military zones	262	17.85
Sports facilities	43	2.93
Public services	14	0.95
Total	1467.7	100.00

eight stories) that house the headquarters of many prominent domestic firms and banks alongside office buildings constructed by either foreign or domestic real estate development companies.

From the case study, it can be seen that almost 10.4% of the area (152.3 ha) has already been transformed into office space on the former sites of pharmaceutical factories and residential areas. The transformation of the study area to date has been on derelict land and land that previously occupied by medium-sized industrial companies. The availability of large plots of land on the major axis connecting the existing business centre with the second Bosphorous Bridge has attracted interest from real estate developers and large-scale enterprises with global functions, resulting in rising land prices, especially for the larger plots of land. Although there are still many low-density and low-quality areas with the potential for transformation adjacent to the recently developed high-rise office towers, the dominance of a small ownership pattern makes transformation difficult due to problems experienced in merging the individual plots. For this reason, some enterprises have chosen to locate in the high-income residential area to the east of the major axis. However, this area was registered as an urban historical site in 2008, and since then, the municipality has been trying to renovate the existing buildings and return them to their original forms and functions, as planned in 1945.[1] Today it can be described as a chaotic-built environment, featuring a high-quality urban core surrounded by squatter housing units, middle- to high-income residential areas and small manufacturing units (Table 11.1).

The change in the built environment and consequently the economic structure has naturally triggered changes in the social structure of the study area. The data drawn from the indicators enables a discussion of the nature of changes and the implications of the urban dynamics of the recent past. The sets of changes defined in the analytical studies, verified by the large set of indicators given in Table 11.2, are grouped under three headings:

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[1] Planned in 1945 by architects Kemal Ahmet Aru and Rebi Gordon. Construction was completed in 1947.

11.5.1.1 Functional Transformation of the Case Study Area and Increasing Global Activities

The Büyükdere-Maslak axis and the areas in close proximity have proven to be very attractive for foreign capital firms. According to the figures of the General Undersecretary of the Treasury, in 2005 there were 518 foreign capital firms located in the case study area, constituting 10% of total firms in Istanbul and almost 5% of the foreign capital firms in Turkey (11,707 in 2005). Among these firms, 24.7% are engaged in commercial activities, 20.4% in foreign trade, 14.8% in different types of producer services and 9.7% in other sectors with lower shares. More than half of the foreign capital firms are joint ventures with European firms, or are branches of European companies, whereas the share of Middle Eastern countries is 20% and the United States is about 10%.

The change in land-use pattern has had diverse impacts on the existing enterprises located in this area. According to the findings of the questionnaire survey, the existing large-scale enterprises have been positively affected in terms of attracting new functions (41.2% positively affected, 31.2% stayed the same and 27.6% negatively affected). For small enterprises, however, the new conditions have been less favourable, with only 22% witnessing an increase in income, while income levels of the remaining 78% either stayed the same or decreased from the 1990 levels.

The transformation of the area has a positive impact on the competitiveness of Istanbul and supported Istanbul to be able to adapt to the new conditions imposed by globalisation, which enhanced the resilience of the large metropolitan region. However, increasing global functions have put pressure on companies to move their existing activities, and therefore labour, while providing favourable working conditions for skilled people working in new global activities, which has led to increased socio-spatial segmentation. On the other hand, the intensification of core functions within a limited area has had a number of impacts on the urban ecosystem. The increases in building density and the transformation of industrial sites and residential areas to CBD functions on the Büyükdere-Maslak axis have resulted in an escalation of traffic loads, congestion and energy use, thus contributing to a rise in air pollution levels and loss of the resilience of the urban system.

11.5.1.2 The Impact of the Core Functions on the Labour Market and Consequent Transformations to the Social Structure

While the case study area has undergone a transformation to accommodate business functions, the characteristics of the neighbourhoods have also changed. According to the findings of the questionnaire survey, almost two-thirds of the residents moved to the area from somewhere else, while the rest either were born within this district or have been living there for more than 30 years. Most of those that moved to the area after 1990 came from other provinces of Turkey rather than from other districts of Istanbul. In Zone 1, where the transformation is actually taking place, 23.8% of those surveyed have been living in the same housing unit for more than 20 years,

while this figure is slightly lower in the surrounding areas that have undergone only limited transformation.

Many of the households believe that the area still offers advantages as a residential area, since half of the tenants had sought new rental properties within the same district; although those living in the primary transformation zone (Zone 1) complain about decreasing social relations and trust. Besides this, more than half of the households living in rental housing are unhappy with the increasing rents that came with the transformation of the district into a business core.

In the case study area, still it is possible to define the existence of social capital (with the help of connectedness, trust and collaboration of the existing residents), although this varies by zones. Especially in the squatter housing areas, more than two-thirds of households had relatives living in the same neighbourhood, as well as friends and compatriots. While these residents emphasised the importance of social connectedness, in the other zones, the levels of social connectedness and social networking were relatively lower.

11.5.1.3 The Substantial Impacts on Travel Patterns and Traffic Flows in the Metropolitan System due to the Transformation of the Case Study Area

The transformation process on the Büyükdere-Maslak axis has had obvious impacts on employment and population structures: firstly, by creating employment opportunities and increasing the number of people commuting to the area and secondly, by attracting a new working population that wants to be close to the new core functions.

The results of the questionnaire survey showed that a small share of the workforce lives in the surrounding neighbourhoods, while the rest commute in from other areas. While 60.4% of the workforce comes from neighbourhoods on the same (European) side of the city, 36.6% commute from the Anatolian side of the city, meaning that they have to cross one of the two Bosphorous bridges. The second bridge over the Bosphorous (Fatih Bridge) offers a relatively easy connection between the Büyükdere-Maslak axis and the other side of the metropolitan area, which is one of the reasons why the area is considered attractive for urban core functions. However, this has increased the amount of traffic, and both bridges are currently overloaded, leading to decreased traffic speeds and congestion on the connecting roads to the bridges.

The questionnaire findings indicate that of those commuting to work from the case study area, 75.7% are travelling only a short distance, 8.8% are travelling to places relatively further away from the case study area, 9% are travelling a considerable distance from their place of residence and 7.5% are commuting to areas outside Istanbul. The findings also show that 85% of students attend schools outside the case study area but travel only short distances to reach their schools, whereas 5% of the students have to cross to the Anatolian side of the city. The modal share of private cars in commuting journeys is 28.04%, which is close to the estimated ratio for Istanbul.

Obviously, the origin of the trips made by customers to this new urban core is even more important. The questionnaire survey findings show that about one-third (30.5%) of people come from the immediate surroundings, while 33.2% have businesses in the existing urban core and 6.6% commute from the peripheral areas of the metropolitan area. Additionally, the figures indicate that 20.1% of the main customers of the new producer services located on this axis are from different cities in Turkey, and 9.6% are from abroad.

Both the incoming and the outgoing traffic in the area create considerable amounts of traffic load and congestion. Although the recently built metro system has connected this area with Istanbul's traditional CBD, as well as with some of the residential quarters on the European side of the city, it has not been enough to solve the traffic problems. Of the outgoing trips, journeys by metro account for only 5.8% of the total trips, with an even lower for the incoming trips. The results of the interview survey show that creating an urban core in this area has generated more long-distance intra-urban trips than short-distance ones.

The incoming and outgoing traffic, combined with the transit traffic, generates a significant traffic congestion problem, especially during rush hours. According to the figures provided by the Traffic Department of the Greater Istanbul Municipality, the average weekday speed of traffic on the Büyükdere Avenue falls down to 5.6 kph during the morning peak hours and to 11.2 kph in the evenings. The Transport Department of the Istanbul Greater Municipality claims that at the Zincirlikuyu Junction, which marks the start point of the traffic congestion along the Büyükdere Avenue, traffic speed is measured as 34 kph in the morning off-peak hours and 36 kph in the afternoon off-peak hours.[2] Traffic congestion is one of Istanbul's main problems, negatively affecting the quality of life in the city, as the questionnaire survey on the foreign enterprises in Istanbul has depicted (Eraydin et al. 2008).

The increasing volume of traffic and the large number of long-distance trips are major sources of pollution in Istanbul. The stations measuring air quality close to the project area provide evidence of the increasing levels of pollution, particularly during rush hours, negatively affecting the sustainability of the Istanbul metropolitan area. The findings of the study of Istanbul (Eraydin 2010) show that increasing pollution due to traffic exceeds the carbon uptake levels of forests, green areas and the sea. Moreover, the sprawl of the city, which is another facet of metropolitan growth, also has a marked effect on natural resources, especially forestry, which is vital for controlling air pollution levels.

11.5.2   *Bahçeşehir Case Study Area*

While the main actors in the housing market were previously developers and cooperatives, after the 1980s, the government became a key actor in housing provision. Neoliberal principles adopted in the field of urban development after the 1980s

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[2] The figures refer to weekdays in September 2010.

Table 11.3 The land-use patterns in Bahçeşehir and its surroundings

Different land-use development types	Size of the area (hectares)	% of the total
Mass housing areas (already completed)	352	2.9
Mass housing area (under construction)	951	7.9
Urban land stock transferred to HDA	287	2.4
Squatter housing area (not transformed)	273	2.3
Residential area	690	5.7
Industrial zone	865	7.1
Mass housing areas developed by cooperatives	461	3.8
Military zone (within the case study area)	1,274	10.5
Olympic village	149	1.2
Urban green areas	750	6.2
Total built-up or planned areas	6,052	50.0
Total area	11,500	100.0
Agricultural or unused areas	5,448	
Areas transformed from forests	1,974	

defined the housing sector and construction as being at the core of the policies, plans and projects (Türel and Koç 2008), but unfortunately little attention was paid to urban form and the distribution of urban living and working areas. Criticisms have been centred around the increasing travel distances and journey times, as well as on their negative environmental effects, which have resulted in the loss of agricultural land, forestry and the ecosystem.

The Bahçeşehir Housing Development Project, which is located on a former agricultural area, stimulated development on the western periphery of the city. It triggered a population explosion in the small villages that existed in this part of the metropolitan area and motivated the transformation of a substantial amount of agricultural land for different urban functions. The existing land-use pattern, after experiencing substantial transformation, is given in Table 11.3.

The transformations taking place have important implications on the urban systems that can be summarised under three headings, namely, impacts on environment resources, increasing commuting distances and traffic flows and structural changes in the remote periphery. The indicators used to define the impacts of the Bahçeşehir project on urban resilience are listed in Table 11.4.

11.5.2.1 Urban Sprawl and Its Impacts on Environment Resources

Various negative effects of urban sprawl were initiated with the Bahçeşehir housing project in the north-west part of the metropolitan area. Firstly, not only was there a loss of agricultural land, but the environment was also compromised as a result of the excessive demand for environmental resources and ecological services. The loss

Table 11.4 The indicators used to verify the impact of different dynamics on urban systems

Major changes	Impacts on the urban systems	Indicators of resilience
Urban sprawl and loss of environmental resources	New residential projects on agricultural land	Increase in water demand for the projected population
	Urban sprawl	Loss of agricultural land over the last 30 years
		Green areas converted to built-up areas
	Population growth in the periphery	Loss of carbon uptake capacity of green areas
		Loss of endemic flora and fauna
Increasing commuting distance and volume of traffic leading to rising pollution levels	Increasing housing on earthquake-risk areas	Share of building resistant to earthquake in total
	Increased commuting distance and travel time	Increase in average commuting distance and journey time
		Change in modal distribution of trips in favour of car ownership
		Increasing trips using private modes of transportation
		Long-distance trips to workplaces of residents
		Increase in the share of transport costs in household budgets
		Levels of carbon emissions due to volume of traffic
Transformation of the social, economic and spatial pattern of the periphery	Increasing air pollution	Residential segregation among groups with different education levels and occupations
	Increasing diversity among social groups	Increasing differences in the levels of education of population
	The socio-spatial segmentation	Number of dwelling units by the quality levels
	High-quality housing supplied for upper socioeconomic group pressures on lower income groups to leave the area	Change in the socioeconomic status of residents
		Change in social connectedness, trust and collaboration
		Level of population turnover
		The difference between outgoing and incoming groups to the area

of agricultural land over the last 30 years obviously represents a serious economic loss; however, the transformation of the nonagricultural land is also important due to the loss of flora and fauna. For the Istanbul region, being one of the richest parts of Turkey in terms of endemic flora and fauna, this issue is important, but what is also important is the amount of green areas lost to development without planning permission in the vicinity of the case study area, which grew considerably with the arrival of the housing projects.

Secondly, the sprawl of the urban population in this part of the city constituted a major threat to the already-scarce water resources of Istanbul. Some reservoirs can no longer be used to supply drinking water due to residential development in the watershed areas and the subsequent discharge of insufficiently treated waste water into the existing tributaries. In the case of Bahçeşehir, the lake downstream from the area (Küçük Çekmece) exceeded the pollution levels of potable water, and so a new reservoir upstream from the area was required, which has been already undertaken by the Istanbul Greater City Municipality.

Thirdly, not only the Bahçeşehir housing development project but also other new urban growth in this part of the metropolitan area brought about a depletion of forests, which are vital for environmental sustainability in Istanbul. The forestry area converted for residential use and other urban functions from 1990 to 2000 reached 26,740 ha, which is equal to 10.2% of the 2,000 total (Aksakal et al. 2009). Obviously, the loss of green areas will negatively affect the carbon budget of the city, since subsistence of forests on the northern part of the metropolitan are very important for the air quality of Istanbul.

Fourthly, the sprawl of the city to the north-west of Istanbul, where Bahçeşehir acted as a pull factor, has accelerated the construction of buildings in earthquake-risk zones. The legislation to ensure the construction of earthquake-resistant buildings is rather new, and so there are doubts whether the new developments, even those constructed by the public sector, conform to the required standards.

11.5.2.2   Increasing Commuting Distances and Traffic Flows

One of the negative effects of these projects and the associated urban sprawl has been an increase in traffic flows. Commuting to and from this area is either by private car or by other road-based public transport, since the development and its surroundings are not connected to the city by rail or subway, which is a major drawback of the area. The findings of the household questionnaire survey showed that only 22.9% of the household heads worked within the same district, with the remaining percentage having to commute to work. Of these, 53.7% travel by car, 28.3% use shuttle services provided by the firms or public organisations for which they work and only 14.4% use public transport. The data on the location of workplaces of households living in Bahçeşehir showed that almost half of the people have journeys lasting over half an hour, with around 15% having to travel for more than 1 h to their place of work.

11.5.2.3 The Structural Change in the Periphery: Transformation of Remote Residential Areas in the Periphery into New Urban Nodes

According to the 2007 figures provided by the Turkish Statistical Institute, the population living in Bahçeşehir is 15,027; however, the total population living in the surrounding areas, where the construction of housing estates was accelerated by partial plans, was 209,686 in the same year. Most of the people (83.2%) have been living in this area for less than 10 years, having moved from different districts of Istanbul, in particular from the European side, as well as from other cities (17%). Those that moved from the Anatolian side of Istanbul constitute only 5%, while the share of households that moved from the immediate surroundings constitute 20.9% of the total. The rest moved from different neighbourhoods close to the urban core. As expected, 31.7% of the respondents to the questionnaire indicated proximity to work as an important factor in their choice of location. This indicates that not only has there been a sprawl of the residential area but also that increasing numbers of workplaces and industrial establishments have been moving to the outer periphery of the metropolitan area.

The findings of the survey indicate that more than 90% of households are happy living in the area and have no desire to move. Those that consider traffic congestion and their distance from the urban core as problems constitute only 3% of the total. It is apparent that those people that did not consider their distance from the city to be a problem had different activity patterns. According to the survey findings, the lifestyles of people living in the area are restricted to a limited territory that does not extend far from their place of residence. Almost 90% of the population claimed they did not attend social events, while only 6% attend events only in close proximity. Only 4% of the respondents claimed to have attended events in the urban core during the last month, which is similar to the figure for last year.

The respondents claim to have close friends (87.3%), compatriots (53.7%) and relatives (42.6%) living in the same housing estate, which encourages dense social relations and supports closed interaction patterns among the households. These findings mean that for most of the households the place in which they live provides opportunities for social interaction, although some feel that the interaction pattern is quite restricted.

11.6 The Evaluation of the Case Studies as the Outcomes of Policies and Plans of the Recent Past

In recent years, two major policies have brought considerable changes to the Istanbul metropolitan region. First, the policies and projects defined by the Istanbul Metropolitan Municipality, which, with strong support from the central government under the banner of "*supporting Istanbul to become a leading global city*", aimed to create new spaces of attraction for foreign enterprises and major domestic companies.

Beginning in the 1980s, the most prominent domestic firms, while searching for land on which to build commercial real estate, were unable to find available land in the traditional urban core. This, in part, led to the start of the development of the Büyükdere-Maslak axis. Later, the area became attractive to foreign enterprises, creating demand for transformation and intensification in the adjacent zones. The second policy that accelerated urban growth was launched in the early 1980s and brought about a rapid increase in available housing as a result of mass housing projects in different parts of the metropolitan area. Although the number of dwelling units built by small-capital producers was remarkable, the government was keen to encourage the development of housing estates with new amenities that would not be available in the inner city neighbourhoods. The case of Bahçeşehir is a good indicator of how changes in land and housing development policies paved the way for urban sprawl.

It is possible to trace these policies on the three plans of Istanbul since 1980.

The first plan, prepared by the Istanbul Metropolitan Planning Bureau, was drawn up in 1966 by the Ministry of Reconstruction and Resettlement and was approved by the same Ministry in 1980. The proposed urban form in the plan was a mixture of compact and linear forms, since it designated the revitalisation of the CBD and pushed for the expansion of the urban core functions towards the immediate surroundings. The other objective in the plan was the creation of subcentres to minimise average commuting distances. However, the construction of the second Bosphorus Bridge (1988) and the Trans-European Motorway (TEM) encouraged urban sprawl by making high-speed commuting by motor vehicle possible, thus changing the geography of the city.

In 1984, the Greater Istanbul Municipality formed a new City Planning Directorate to replace the Istanbul Metropolitan Planning Bureau. The new directorate prepared a new master plan at 1/50 000 scale, which was approved by the Council of Greater Istanbul Municipality in 1995. This plan aimed to retain the importance of the CBD and proposed its expansion towards adjacent areas. The relocation of industry from central locations, particularly of those causing pollution, to the fringe and the transformation of former industrial sites for office and other commercial functions were expected to create the required space for the enlargement of the CBD. This plan also designated new housing areas at the fringe, such as in Bahçeşehir, to serve the increasing population and to relieve pressure on the land and housing prices in the inner city. Regularisation schemes for most of the former unauthorised housing areas and improvement plans for such settlements were prepared and approved in accordance to the Building Amnesty Law (ratified in 1984). In summary, compactness was preferred to sprawl in the location of service sector activities, and of industry to some extent, while tolerating the expansion of residential areas towards the fringe, thus clearing the way for sprawl.

The third plan, at 1/100,000 scale, was prepared by the Istanbul Metropolitan Planning Office (IMP) of the Istanbul Greater City Municipality, following the enlargement of the municipal boundaries to the boundaries of the province in 2004. During the preparation of this plan, it was calculated that Istanbul could accommodate a maximum of 16 million inhabitants based on its ecological thresholds – constituted

by the existing preservation zones, water catchment areas and forestry land; however, the indications are that the population will reach 22 billion by 2020. The plan proposed a change in the composition of certain activities in the metropolitan areas, such as a reduction in the share of industry in total employment to 20% and a rise in the service sector's share to 80% by 2020. The plan proposed to retain the CBD in its existing location but to develop two subcentres and one "attraction centre" on the European side, along with three subcentres and one "attraction centre" on the Anatolian side. The aim was to enhance the decentralisation of some of the service activities to subcentres due to physical limitations preventing the expansion of the CBD. The development of new residential areas, on the other hand, was proposed at the fringe in the form of large estates with many shared services and amenities. From this it can be seen that the decentralisation (and sprawl) of housing was ahead of the decentralisation of service activities at this stage.

In addition to these strategic master plans, several local plans have been prepared, defining building rights that will lead to different physical outcomes. For example, although the 1980 Master Development Plan was against the development of the city towards the north, local plans such as 1988 Büyükdere Avenue Implementation Plan increased the floor area ratio (built-up area/total size of the parcel) to 4.5 for parcels located on Büyükdere Avenue. The changes in building rights, contrary to the decision of the master plan, had been a driving force in the development of an international business centre along the Büyükdere-Maslak axis. Similarly, in the Bahçeşehir case, although the plan for this area was to provide a certain quality of life, due to the partial planning practices and the increasing number of housing estates built by housing cooperatives and private developers, the area has taken on a rather chaotic structure.

This brief evaluation of policies and plans shows that, although environmental concerns were expressed at different levels, the concerns for environmental sustainability became a residual issue under the pressures of economic motivations and the rapidly increasing demand for housing, workplaces and other facilities. In Istanbul, being the major centre of attraction in population movements both from different regions of Turkey and abroad, planners were forced to open up new areas for different uses to meet demand, although ecological limits were evident. Moreover, it can be said that the existing plans failed to control and guide urban development. The decisions to protect natural resources, which are vital for this huge urban settlement, were not effective enough to control the growth of new housing and other urban functions in protected areas, particularly those in the water basins and forests to the north of the metropolitan area.

11.7 The Contribution of the Resilience Concept to Understanding Urban Processes

In the last stage of this project, the urban processes represented by the case studies with reference to the economic, social and environmental dimensions were explored with the help of a set of indicators. The indicators denoted to what extent the built

environment had transformed to meet the new conditions defined by the global process and the transformability of the economic structure under global market pressures. The selected indicators show that the capacity of the urban system to respond and adapt to changing conditions has been rather successful. New conditions trigger changes in the built environment, as well as in social and economic structures. Transformation projects, new urban built-up areas and changes in the composition of activities are positive indicators of adaptability, although the cost of adaptation has been on the back of the labour markets in the form of increasing income differential, leading to increasing residential segregation.

In answer to the question of whether the city is prepared for change or not varies among the different social groups, as can be seen from the analysis of the Büyükdere-Maslak axis, while same can be said also for the built environment. The indicators show that while some areas are able to adapt to global pressures, the adaptive capacity of certain areas is, in contrast, rather limited. The reason for this is the limited flexibility of certain built-up areas and the difficulty faced in meeting the increasing demand generated by the transformation of activities within the area. Moreover, adaptation creates problems in terms of connectivity. Flows within the metropolitan area have become difficult, indicating a decreasing resilience of the urban system; however, the most important issue is the limited recovery experienced in terms of the degradation of environmental quality.

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Chapter 12
Urban Resilience and Polycentricity: The Case of the Stockholm Urban Agglomeration

Peter Schmitt, Lisbeth Greve Harbo, Asli Tepecik Diş, and Anu Henriksson

12.1   Introduction

This chapter explores the practices of implementing a polycentric strategy in the Stockholm urban agglomeration. The Stockholm case has been chosen to illustrate the need for a broadening of the understanding of resilience in actual land-use planning to a state in which the governance system can be viewed as a resilient structure that is flexible and adaptable to rapid changes at the city-regional level.

It is argued that when changing the scale of inquiry, it is beneficial to have a different empirical focus, that is, when evaluating resilience on a city-regional scale, it is more useful to grasp the resilience of such structures and their inherent dynamics and processes than the individual instruments applied to improve the resilience at a local level. This is partly based on the claim that a well-functioning territorial governance system is a prerequisite for actual resilient land-use planning for the whole city-region (in this case, the urban agglomeration of Stockholm) but also that the structure of the governance system should itself contain attributes that characterise urban resilience in a more dynamic and process-related way, namely, adaptability, transformability and connectivity. Thus, this case study analyses the resilience of a governance system at a city-regional level, and not the resilience of actual land-use changes at a local level.

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Urban resilience is defined here as an established type of operating governance regime (with various modes and mechanisms) that integrates a high degree of adaptive and strategic capacity to manage different socio-economic, ecological and spatial dynamics in a sustainable manner. In this light, this chapter discusses the experiences and learning processes of planners at a local and regional level when applying and following up on the strategic concept of polycentricity in the Stockholm region since the idea was first introduced in 2001. It is argued that the application of this concept can be considered as a major response to sustainable planning to manage, from a European perspective, notable high growth dynamics in the Stockholm urban agglomeration.

12.2   Visiting Stockholm City Region

When discussing spatial planning and development in the Stockholm urban agglomeration, one needs to mention the 26 municipalities and their individual municipal plans, drawn up by the so-called Stockholm County and the Office of Regional Growth, Environment and Planning (up to January 2011 named the Office of Regional Planning). The office has the mandate to develop nonbinding regional plans that are to be adopted by the County Council (see details in Chap. 7). These plans are based on several stages of negotiations with the participation of all municipalities and other relevant stakeholders and thus are consensual in regard to specific city-regional development goals. This kind of indicative regional planning is unique to Sweden – nevertheless, one should bear in mind that there are only a few examples of a "regional planning approach" throughout the country (Hårsman and Rader Olsson 2003). In the current plan for 2010, several long-term strategies for land use, infrastructure, economic development and environmental protection are incorporated, which makes it a real cross-sectoral comprehensive development programme for the Stockholm region. However, the municipalities are by far the strongest player in Swedish spatial planning, since their "planning monopoly" is relatively far-reaching when compared to other countries in Europe.

Stockholm's urban fabric has spread outwards over the centuries from the Old Town, at a ridge between the Lake Mälaren and the Baltic Sea, with clearly identifiable "annual rings" where development has jumped over to the "next island" and/or next municipality. Nevertheless, the Stockholm urban agglomeration is still marked, both morphologically and functionally, by a rather monocentric territorial layout, which is basically shaped by the inner city of Stockholm and a number of neighbouring dense urban areas with a relatively high centrality in terms of workplaces, such as Solna, Sundbyberg and Nacka (Fig. 12.1).

As the figure above highlights, the urban agglomeration's topography is made up of several islands and the bodies of water between them. This specific morphology of the physical environment is thus one major reason for both the concentration of population and the transport challenges, since distances are simply longer and the basic transport infrastructure is extremely costly to build, having to scale the rocks. In addition, it is very sensitive to disturbances such as climate change.
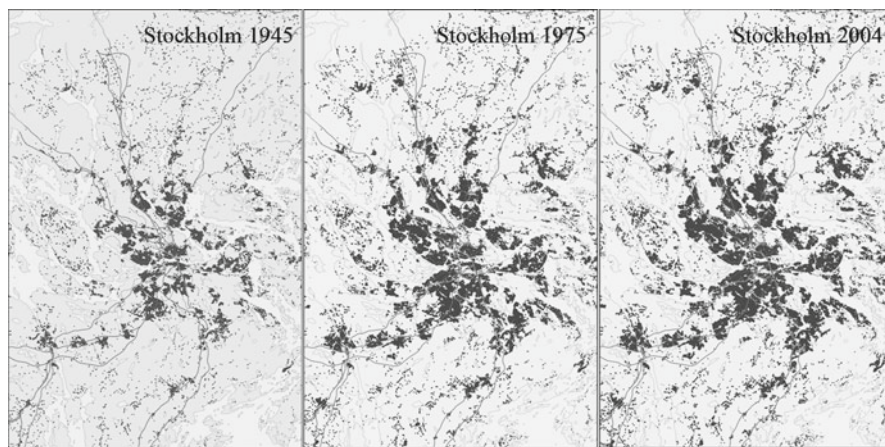
Fig. 12.1 A rough sketch of Stockholm's urban fabric 1945, 1975 and 2004 (Source: Lantmäteriet 2011)

12.2.1   A Fast Growing City Region

Although the net migration between the city of Stockholm and the rest of Sweden was negative at the beginning of the 1990s, its development has turned around so that the population has increased by 13% from 1990 to 2002 (compared to 4% for the whole country), which corresponds to a total of 200,000 people. If it were not for foreign immigrants, however, the number of inhabitants would have decreased in this period (Hermelin 2004).

Since then, the population has increased relatively quickly not only in the city of Stockholm but also in particular in the entire Stockholm County, with an annual growth rate of 30,000 inhabitants per year – 3.5% higher than the rest of the country. At the end of 2010, the population of Stockholm County was 2.054 million, while the city of Stockholm counted 847,000 inhabitants. The latest forecasts predict that in 2030 the population will reach 2.4 million inhabitants (maybe even higher at the current rate of growth). Besides the ongoing (in-)migration to Stockholm County (from other parts of Sweden, but also from abroad), a further reason for this population gain is the current baby boom (around 2.1 children per woman in Stockholm County) (Office of Regional Planning 2010).

12.2.2   The Planning Response: Polycentricity and Densification

The future ambitions in terms of land development planning for the urban agglomeration of Stockholm can be easily read from the recently adopted regional plan, as well as the 2010 adopted comprehensive plan of the Stockholm Municipality as the

uncontested main centre and, finally, at least to some extent, from Vision Stockholm 2030, elaborated also by the city of Stockholm (see Chap. 7). For many decades, the interplay between the enlarging housing and labour markets and the improvement of the regional transport system have been the most central issues in the regional planning discourse. According to the Office of Regional Growth, Environment and Planning, the transport system in the Stockholm region is operating close to its capacity, road traffic having increased by 80% since 1970, while the road surface area has only increased by between 10 and 20% (Office of Regional Planning and Urban Transportation 2001). Examples of improvements to the transport infrastructure currently being debated are an extension of the fast tramways in the near future and a third track for the north–south light railway through the city, which is currently under construction (Stahre 2007).

The credo of the Stockholm municipal plan (also adopted in 2010) is to further increase the density of the urban landscape in order to cope with the high demand for, for example, new offices, hotels and other facilities in the city centre, and for housing in the nearby areas and suburbs while at the same time maintaining the urban qualities and the city's attractiveness (Stockholm Stad 2010). In recent years, this has inspired local debate on the pros and cons of high-rise buildings in the city centre. The densification goal has raised arguments related to the use of the green wedges. It will be interesting to see how this will be carried out in practice, being a modest collision with the city plan of 1999, which emphasised that non-built land in the city should be conserved (Stockholm Stad 1999).

The new Stockholm regional plan of 2010 underlines the approach of its forerunner, the Regional Development Plan from 2001, which introduced for the very first time the concept of polycentricity at a city-regional level. The emerging polycentric shape is to be structured by eight so-called regional urban cores located within a 15–40 km radius of the central core (i.e. the inner city of Stockholm and some adjacent central urban areas). Such "cores" shall serve as "territorial anchors" to concentrate land developments, as well as to accommodate distinct urban functions (see Fig. 12.2). In the latest regional plan, this normative concept has been renewed to follow up the intended gradual transformation of a rather monocentric urban configuration into a polycentric one.

The major rationale behind this can be described as follows: The central core has to be released from the strong pressure within a growing urban agglomeration. Hence, these eight (formerly seven in the regional plan of 2001) "regional urban cores" shall help to create a robust polycentric structure supported by a corresponding transport system until 2030. The development of the selected regional urban cores shall be promoted by distinct investments into the transport system, by increasing the density and compactness of energy efficient settlements, by improving the urban environment, by creating competitive milieus and, finally, by providing them with distinct urban functions (such as homes for more diversified work places, higher education and health-care facilities, better urban flair through cultural and gastronomic provisions) (Office of Regional Planning and Urban Transportation 2009; Office of Regional Planning 2010). It remains to be seen if such a planning concept helps to combat urban sprawl, as it is claimed that these regional urban cores have also potential for further intensification.

In summary, the strong dynamics of future urban development, and thus land consumption, are well reflected in these policy documents, as also discussed in

Fig. 12.2 The intended polycentric territorial layout in Stockholm County: one 'central' and eight 'regional' urban cores (Source: By courtesy of the Office of Regional Growth, Environment and Planning)

Chap. 7. It is obvious that the pace of growth in the Stockholm urban agglomeration necessitates a wide regional perspective to land-use development, as well as cooperation beyond the administrative borders, if a robust response to such challenges is to be found. It became clear from the case study analysis that the intended creation of a (modest) polycentric urban structure at the level of the Stockholm urban agglomeration was a key concept, offering a clear understanding of the pressure on land use on the one hand, and the high degree of adaptive and strategic capacity to manage socio-economic, ecological and spatial dynamics in a sustainable manner in the Stockholm region on the other.

12.3   Urban Resilience and Polycentricity: Setting the Scene for the Empirical Study

This study aims to explore the practices and capacities of the polycentric development strategy being developed for the Stockholm urban agglomeration since 2001.

As discussed in Chap. 3, the "urban resilience" approach conceptualises cities (or city regions) as complex adaptive social-ecological systems and develops ways of assessing urban vulnerability and identifying principles and opportunities so as to contribute to resilience in "urban" systems. Here, the level of adaptability and transformability is inevitably dependent on the ability to self-organise and learn, as major social components within such socioecological/urban systems (Carpenter et al. 2001). In this sense, according to Gupta et al. (2010), "adaptive institutions" can encourage learning among the actors by questioning the socially embedded ideologies, frames, assumptions, roles, rules and procedures that dominate problem-solving efforts. Maru (2010) notes in this context while the capacity to self-organise and adapt are shared properties of social (and ecological) systems, "learning" is an essential human (and thus individual) capability.

Having emphasised this, in this case study, urban resilience is considered to be an established type of operating governance regime (with various modes and mechanisms) that integrates a high degree of adaptive and strategic capacity to manage different socio-economic, ecological and spatial dynamics in a sustainable manner. More concretely, the intention has been to explore to what extent the normative concept of polycentricity at the regional level, as introduced in 2001 and followed up in 2010, can be considered as a useful tool for establishing a spatial system that is less vulnerable to future disturbances, and that is better equipped to manage urban dynamics.

As already touched upon in Chap. 4, it is argued that, based on further investigations, the concept of polycentricity demands a high level of systemic understanding, in that one needs to delve deeper into the character of such urban configurations today and the logics and inherent processes of spatial planning of the urban agglomeration and its different "cores"/"centres" in particular (Schmitt 2010). Therefore, this analysis is focused upon the understandings, challenges and disconnections of this strategic policy approach (to promote and even create a more polycentric urban agglomeration) since 2001, as perceived by urban planners.

This research addresses three dimensions of urban resilience. The first one is the dimension of *transformability,* or the extent to which planners perceive physical changes in the land-use structure, that is, in making the Stockholm urban agglomeration more polycentric (here in particular regarding its morphological territorial layout). However, in contrast to Walker et al. (2004), the intention here is not to talk about the creation of a fundamentally new system, as the current urban system is still tenable (even though coming increasingly under pressure) and could certainly not be replaced entirely as can be the case in ecological systems.

Secondly, the dimension of *connectivity* is addressed, which is the degree to which nodes of a network are directly linked with each other. In this study, such nodes are represented by the case areas (the six regional urban cores and the central one) and the linkages of their (potentially improved) accessibility, based on the observations of urban planners. From a more functional polycentric perspective, another issue would be how far these cores are able to develop complementary profiles in order to develop synergies at the city-regional level (Meijers 2007). In implementing this, not only is the physical dimension decisive but also, from a more resilient perspective, the relationships between actors and organisations. In the case study, the tension between cooperation and competition among the regional urban cores that are in focus here (see below) has been discussed, with particular attention paid to the fact that most of the regional urban cores cover more than one municipality.

In addition, the "adaptive capacity" of the existing governance regime (dimension *adaptability*) at the local and city-regional level within the Stockholm urban agglomeration has been analysed. Here, the focus is on the factual organisational and institutional changes (i.e. in terms of new routines, patterns of [inter]action, involvement and participation) as well as individual appraisals (in terms of learning curves, perception and awareness) by applying the concept of polycentricity in the urban agglomeration of Stockholm. Also addressed is the need for understanding among the six regional urban cores in focus here, as an emergent system that requires multilevel coordination, which is another attribute of the required adaptive capacity. This is particularly relevant between the local and the city-regional authorities, as well as at the inter-municipal level, since, as stated above, a number of cores are "owned" by more than one municipality.

The empirical research has been directed at the closest six out of the eight designated regional urban cores and, at least to some extent, their relationship to the central core (see Fig. 12.2). The remaining two regional urban cores, Södertälje to the south and Arlanda-Märsta to the north, were not covered, since the latter has been only designated in the 2010 regional plan and is thus at a very early stage in its planning and implementation phase; and Södertälje, on the other hand, can be considered as an independent city in the greater Stockholm region with rather different characteristics and needs in the planning process.

In summary, these seven case areas help to analyse ex post the applicability of the concept of polycentricity since 2001 and may help in making speculations for the future in this respect. The case areas and their criss-cross relationships were assessed in terms of their conformance with the underlying objectives of the regional development plan of 2001 and the recently adopted plan of 2010.

The empirical research has been conducted in two stages: First, the regional and municipal plans were analysed to assess whether there is coherence between the intentions of the regional plan and those at the municipal level, and second, a number of interviews were conducted with planners responsible for the development of the "cores" in the municipalities and with planners responsible for the overall polycentric development of Stockholm at the city-regional level, from which it can be deduced how far they see resilience as an integral dimension of their planning approach. Since most of the regional urban cores cross municipal borders and thus are to be planned between two and even three municipalities, a total of 12 planners have been interviewed.

12.4 Findings of the Empirical Research

From the outset, the concept of polycentricity was received positively by our interviewees as it, unsurprisingly, brings those municipalities that own a regional urban core to an advanced position when compared to others that do not. However, during the course of the research, it became clear that not much has happened in the Stockholm region in regard to physical changes ((Office of Regional Planning and Urban Transportation 2009), interviews held in 2010). The most concrete results were rather to be found in changes of perceptions and routines. Generally speaking, the designation of regional urban cores in the regional plan of 2001 (Office of Regional Planning and Urban Transportation 2001) has to some extent been a driver of planning practices and their understandings. In other words, the interviewees were hesitant to judge to what extent the planning concept had helped guide the material outcomes of urban development since 2001.

First to be mentioned is that the concept has been integrated formally into most of the municipal plans, and some municipalities have even deepened their planning ambitions with additional development plans for their own particular areas. Also, it has resulted in many innovations regarding the self-image of the municipalities concerned, their awareness of the "city-regional" dimension and how far "their" regional urban cores are related to others. In addition, it has helped to mobilise some "informal planning practices" such as inter-municipal cooperation and the development of professional networks within the Stockholm region. How far the governance system is able to create an adaptive and strategic capacity to manage existing and unexpected socio-economic, ecological and spatial dynamics (viz., a resilient governance regime) is explored, as mentioned above, with the help of three attributes of resilience in the coming sections of this chapter.

12.4.1 Adaptability

Working together with other municipalities in the regional urban core is a novel approach in the Stockholm urban agglomeration that is considered by planners as providing a valuable opportunity to adapt to the current changes and dynamics.

Cooperation with other cores is based on informal meetings and discussions, which are mainly facilitated by the Office of Regional Growth, Environment and Planning; however, the need for a more formal platform to increase the intensity of cooperation has been emphasised. Concerning new tasks or the need for new individual capacities, two of the regional urban cores have employed planners specialised in city-regional issues, while another has employed a co-coordinator to work with the two involved municipalities as well as the private sector in the wider region, and a third has employed a development director, which can in part be seen as a consequence of the application of this concept. The remaining municipalities feel that they have sufficiently dealt with the new tasks within the existing planning offices; however, most of them state that now there is a lot more cross-sectoral cooperation within the municipality.

In addition, the concept of polycentricity has strengthened a systemic understanding of the urban agglomeration of Stockholm through an extension and deepening of the municipal planners' mental maps of the region. Here it has been assessed positively by the interviewed urban planners that the Office of Regional Growth, Environment and Planning has acted like a spider in a web, providing inspiring analyses and background material, but has also, maybe even more importantly, organised forums at which the issues at hand can be discussed with planners from other cores. The Office of Regional Growth, Environment and Planning itself considers this work with polycentricity as an eye-opener for their work in general, since they have recognised the need for an active backing of the objectives indicated in the regional plan. In former times, there was rather a tendency to sit back once a regional plan had been approved – but now the focus has changed to become more actively involved as an informant, but also partly as a moderator, in the application process.

Since it is a long-term strategy, there have been indications that it has also affected the interplay between professional planners and politicians, as the latter are not used to thinking in periods of 20 years or so. Moreover, it has emphasised the need to coordinate communication processes carefully, as the concept is rather challenging and necessitates more effort to depict the inherent objectives that are associated with it.

12.4.2 Transformability

As indicated above, the polycentric structure has been incorporated widely into the municipal plans for each of the regional urban cores. However, given the recent implementation of these plans, few physical changes are evident at this point. One main obstacle, which has been mentioned several times, is the lack of financial resources for corresponding urban projects. Besides this, the process of implementing new ideas within the factual practices of municipal planning also takes time. A general line of argument is that the regional plan from 2001 paved the way for thinking in terms of being a regional urban core, getting the politicians on board and expressing the idea accordingly in strategic municipal plans. As a consequence of the process to develop the latest regional plan (see Office of Regional Planning 2010) and the more specific ideas expressed within it, the "physical work" can now begin.

Although this might be delayed due to the latest economic crisis, the planning framework is prepared for further utilisation once private and public investments become possible again.

In this light, the concept of polycentricity has been applied so far in terms of handful concrete local strategies with the main emphasis being on mixed land-use development, combinations of work places and quality of life and the building of shops close to commuter railway stations. Additionally, the local population should have access to educational facilities and be able to make use of other services that are specific for each area (medical, IT etc.). In terms of the social dimension, the regional urban cores are planned to offer different types of housing for different groups/classes of society (i.e. different apartments for students and families). In other words, the aim has been to diversify the housing types, which is believed will help diversify social groups and thus combat segregation.

12.4.3   Connectivity

Although in terms of physical connectivity the regional urban cores are in general considered as having good accessibility (both in regard to public and individual transport means), addressing the weak connectivity between them seems to be the biggest challenge. The urban agglomeration of Stockholm is still characterised by a radial structure with a clear lack of robust criss-cross connections between the designated regional urban cores, meaning that the private car is the most dominant means of transport. Secondly, there is a clear mismatch between the planning ambitions raised in the regional plan (and advocated by the Office of Regional Growth, Environment and Planning) and the regional public transport agency (Storstockholms Lokaltrafik, SL). Criticisms have been raised that the latter focuses too strongly on improving its services for accessibility to the city of Stockholm and its close neighbourhoods, instead of recognising the growing demand and potentials of the regional urban cores, which are considered "further outside" in this respect. In other words, it is argued that the regional public transport agency is still rooted in a more traditional way of thinking, with particular focus on linking the city centre with its nearby suburbs instead of strengthening the "emerging nodes" (as represented by the regional urban cores concept) at a larger geographic scale.

With regard to the complementarities of the functional and economic profiles within this emerging polycentric system, one can say that all cores are perceived as having specific profiles. However, if they are all successful in developing mixed housing, good accessibility, diverse labour markets, education opportunities and distinct urban qualities (e.g. as regards so-called "evening economies"), the planners admit that the cores may become very similar, resulting in greater inter-competition. Again, the need for inter-municipal cooperation and coordination has been emphasised here, although admitting that there is already strong competition among the regional urban cores to increase the demand for further housing constructions. It has been declared that informal networking – in particular through the use of the

Office of Regional Growth, Environment and Planning as a platform – is far from sufficient for developing any mutually agreed concepts, for instance, due to the lack of political backing for such strategic arrangements at the level of the Stockholm urban agglomeration.

12.5   Concluding Remarks

The process to develop the new regional development plan for 2010 was, according to the interviewed planners, felt to be more interactive and dialogue oriented than the regional development plan adopted in 2001. Obviously the process has ensured that the new plan's objectives have been further anchored in the application of the concept of polycentricity at the municipal level. The further implementation of the aims of the regional development plan, in terms, for instance, of more essential land-use changes, is, however, a longer process.

Most municipalities that own a so-called regional urban core share the opinion that the 2001 regional development plan was primarily useful in introducing this concept to the municipal politicians and in convincing them that these cores should be perceived from a more city-regional perspective. However, the 2001 regional development plan was also useful, as noted by the interviewees, in that it kick-started inter-sectoral thinking in the planning departments and launched the establishment of the planners' networks needed to develop the regional cores across municipal borders.

Another conclusion to be drawn when comparing the reflected practices of the interviewed municipal planners is that the Office of Regional Growth, Environment and Planning has become increasingly more aware of what is expected of them in terms of how the regional urban cores should develop, taking into account socio-economic functions, accessibility, business profiles or attractive locations for housing. In this respect, the Office of Regional Growth, Environment and Planning has been quite efficient, providing analyses on central themes, conducting workshops and seminars, and as a kind of sounding board for the municipal planners. However, this sense of support is not unambiguous since a number of municipal planners still seem to be a little confused as to how they are supposed to develop their core.

One general criticism of the new regional plan has been that the number of cores is too high; however, such criticisms may actually be a symptom of the global economic crisis and the resulting lack of investments, significantly curtailing their ability to develop the regional cores as desired. Another criterion for the development of the cores is the expansion or establishment of new infrastructure, particularly improvements to public transport to and from the cores. All planners state that this is essential if the regional cores are to become more attractive on a regional scale, for commuters, as it would allow them to access new work places, and also for the existing residents and businesses. This argument, however, highlights a problem with the implementation of the regional plan's vision of a polycentric Stockholm region. The regional transportation agency does not feel obliged to support the

polycentric regional development, which is due to the lack of any formal power in the regional development plan to direct such powerful stakeholders in terms of physical planning.

As regards a resilient perspective, it can be concluded that the concept of polycentricity demands a high level of systemic understanding of the Stockholm city region in general, and its different regional urban cores in particular. Cooperation and coordination seem to be the key issues here (between municipalities and between municipalities and the city-regional level, which is represented by the Office of Regional Growth, Environment and Planning and the County Council). The concept is tied to advances in particular in public transport facilities, which would improve the attractiveness of the regional urban cores. Internally, in some of the municipalities, the concept is used as a tool to gain the attention of politicians by advocating the idea of developing the municipality in line with this concept within their own administration. With regard to the governance structures of the Stockholm urban agglomeration, it has been argued that the work carried out within the regional urban cores has raised awareness among planners and politicians of the benefits and potentials of cooperating with neighbouring municipalities. However, this has resulted in very different expressions, with some regional urban cores developing common plans, while others maintain the concept within individual municipal plans that are then coordinated within so-called inter-municipal core working groups.

Nevertheless, the application of the concept of polycentricity by developing so-called regional urban cores has been highly appreciated by the interviewed municipal planners, in that it allows them to cope with the current and future anticipated growth dynamics. This seems to have been a meaningful response, reconciling the expected tensions in terms of the economic and social, but also environmental changes associated with urban growth in the urban agglomeration of Stockholm. In this vein, it has been argued that the concept can help to increase the city region's robustness to contemporary, but also to such future challenges as economic crises, the dying out of specific sectors, urban sprawl, social segregation, climate change mitigation or further environmental degradation. Apparently, the concept is being seen as a blueprint for many issues that are linked to urban change. On the other hand, it has been acknowledged that the concept of polycentricity requires some considerable learning on the side of the urban planners and other stakeholders. In particular, the adaptability of the current governance regime is challenged, since the further application of the concept demands a high level of individual and institutional capacity, cooperation and coordination between different, and partly changing, stakeholders within, and beyond, the municipality.

As a methodological reflection, it should be noted that the concept of urban resilience has been particularly helpful in enriching this analysis, based on its focus on the institutional responses and individual reflections related to this (until 2001) hitherto unknown planning concept of polycentricity. The concept requires a more systematic understanding of spatial planning and its inherent dynamics and logics in the Stockholm region, since it challenges in a very pronounced way the interplay between the six regional urban cores and the central core while also revealing the agendas and rationales of different planners and their ability to learn and adapt accordingly.

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Chapter 13
Urban Resilience, Climate Change and Land-Use Planning in Rotterdam

Dominic Stead and Tuna Taşan-Kok

13.1 Introduction

> "The very features that make cities feasible and desirable – their architectural structures, population concentrations, places of assembly, and interconnected infrastructure systems – also put them at high risk to floods, earthquakes, hurricanes and terrorist attacks (Godschalk 2003: p.136)".

The general concept of resilience, and more specifically, urban resilience, is becoming increasingly prevalent in academic and policy discourses. Moreover, social, economic and environmental crises and challenges created under the dynamics of urban development reflect an increasing sense of complexity, uncertainty and insecurity about cities and highlight a need to identify new adaptation and survival strategies. However, the contradictions created by market-led tendencies, privatisation and self-responsibility in different levels of urban governance have made contemporary planning practices all the more complex (Taşan-Kok and Beaten 2011), requiring adaptation strategies that are designed to address not only difficult social, economic or environmental issues but also policy contexts driven by market forces. The Dutch planning and urban governance system is an interesting case in this respect, since the Netherlands is one of the few welfare states that retains active central control

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mechanisms in the development and control of land and property. In this respect, it is little surprise that resilience thinking in urban planning has already made its way into the Dutch urban policy framework.

As indicated in earlier Chaps. (1 and 2), definitions and interpretations of resilience vary, and the concept remains relatively fuzzy. Nevertheless, two common dimensions of resilience can often be identified: (1) robustness, or strength (i.e. the ability to withstand an external shock), and (2) rapidity, or flexibility of response (i.e. the ability to bounce back). These two dimensions can be enhanced by mitigation and adaptation strategies, as mitigation can primarily increase the robustness of the system, while adaptation can increase the speed of recovery. On this basis, it can be argued that mitigation and adaptation activities are central to urban resilience strategies (see also Leichenko 2011). This chapter investigates the ways in which mitigation and adaptation activities form part of planning policy in Rotterdam, a city that faces significant threats to its long-term resilience, particularly due to its vulnerability to the impacts of climate change. Indeed, the value of Rotterdam's urban infrastructure (buildings, transport infrastructure, utility infrastructure and other long-lived development) that is exposed to coastal flooding is higher than most other cities across the globe (Nicholls et al. 2007). Not only is climate change a very important issue for the city (as will be described in more detail later), it is an issue that has become a metaphor for the environmental problématique at large (Hajer 1995).

The case of Rotterdam is highly relevant for research into the issue of urban resilience because, not only does the city have a high value of urban assets that are exposed to coastal flooding, it is also extremely vulnerable to river flooding. Indeed, the 2008 Delta Commission refers to the city of Rotterdam as one of the "critical locations" for climate change policy. Rotterdam's vulnerability to flooding is made all the more severe by the fact that parts of the city lie outside its protective dikes and are therefore unprotected against very high water levels. This has resulted in a number of initiatives to develop more climate-proof policies in the city, particularly in the fields of water management and spatial planning. Various activities under the Rotterdam Climate Initiative, for example, are geared towards anticipating and reflecting future climate developments in future spatial plans, implementation projects and management activities from 2012 onwards. As a consequence of Rotterdam's critical location, the city has become a pioneer in the fields of planning, climate change and spatial planning (van den Berg 2010). What is evident from a number of policy documents is that attempts to deal with urban resilience, climate change, adaptation and mitigation are more advanced in Rotterdam than in most other Dutch municipalities.

The methodology followed in this chapter slightly differs from the other case study chapters. As a research focus, the Dutch team has primarily focused on the emergence of resilience thinking in the study of Rotterdam in relation to mitigation and adaptation activities. Living for centuries under the threat of flooding in Rotterdam has resulted in the relatively rapid introduction of the term "resilience" into Dutch spatial planning, although the concept is still too vague to be of practical use. As a methodology, the researchers followed a discourse analysis approach

by analysing policy documents at diverse levels of governance to understand how resilience is being interpreted and adopted. In addition, the diverse adaptation and mitigation strategies contained in these documents have also been analysed. Before examining urban mitigation and adaptation activities and policies for the case of Rotterdam, the relation between these two types of activities and policies is first discussed. Although mitigation and adaptation would both seem necessary for enhancing urban resilience (according to the brief analysis of definitions presented above), they have until recently been developed and implemented quite separately and have sometimes even been in direct competition for the same resources.

13.2   A Short History of the Climate Change, Adaptation and Mitigation Agendas in the Netherlands

Responding to the issues of climate change in a low-lying country like the Netherlands is a huge challenge, especially in relation to sea-level rise. According to two sets of scenarios developed by the Dutch meteorological office (KNMI) and the Delta Commission, sea levels could rise by between 0.20 and 0.40 m by 2050 and by as much as 1.30 m by 2100. Climate change is also expected to result in longer periods of increased precipitation in the winter months and heavier peak rainfall during the summers. This would result in a greater likelihood of flooding in urban and rural areas in the lower parts of the Netherlands, where the storage capacity of the soil, polders and storage basins is limited. A further impact of climate change may be higher air and water temperatures and longer growing seasons, making the Netherlands more suited to certain plants and animals and less suited to others, with implications for agriculture, horticulture, biodiversity and the landscape. However, it is the impact of water, in all its natural forms, that is most important for the Netherlands: water from the sea due to sea-level rise, water from the rivers because of heavier rainfall and water from the ground because of greater variations in groundwater levels.

Climate change has become an important policy issue in the Netherlands for the simple reason that 60% of the country lies below sea level and 70% of the gross national product is earned in these flood-prone areas (Kabat et al. 2005). Without its dikes and other protective measures, almost two thirds of the country would be under water (Wolsink 2006), making flooding the most significant threat from climate change for the Netherlands. The government currently categorises this risk as "low probability, high impact" (van den Berg et al. 2010).

Adaptation did not initially attract much attention in policy-making, due in part to the fear that it may distract the governments' attention from mitigation (Swart and Raes 2007). However, adaptation is now climbing in the planning agenda and contributing to various new vocabularies in environmental discourses across Europe. A key feature of the adaptation narrative is the view that the environment is a natural hazard (Davoudi 2012), and the language of adaptation suggests a future characterised by the inevitability of climate risks and insecurities. Within this narrative,

unpredictability and uncertainty replaces the sense of certainty and the overrated belief in human ingenuity and technology (Davoudi 2012).

While the arrival of climate change, adaptation, mitigation and resilience to the planning agenda have all been quite recent, certain elements are not new, especially in the Netherlands, where certain activities to minimise and prevent flooding have been part of the planning agenda since planning began. The management of land and water has a very long tradition in the Netherlands due to the natural location of coastal zones below sea level. For centuries, the Dutch have been constructing waterways, earthworks and barriers to water, including polders, canals, dikes, dams, locks, windmills and sluices. Floods and storms over the centuries have tested the durability of the Dutch system of water management, and not all have withstood these tests, sometimes with disastrous consequences.

For example, serious floods in the south of the Netherlands in 1906 led to changes in the construction methods of dikes, but less than 50 years later, these adjustments proved to be inadequate during the floods of 1953. The dikes in the south-western parts of the country were unable to protect the country against the combination of a high spring tide and a north-westerly storm, resulting in over 1,800 deaths (comparable to the death toll from Hurricane Katrina in New Orleans in 2005). The events of 1953 prompted immediate action by the national government. The Delta Commission was established and was tasked with suggesting measures to prevent future flooding. Following the advice of the Delta Commission, huge coastal engineering works were launched to reduce the threats from the sea, including the construction of the Eastern Scheldt and the Maeslant storm surge barriers at the entrance to the port of Rotterdam. More recently, in 1993 and again in 1995, extremely high water levels in the Maas and Rhine Rivers tested the integrity of the dikes in the southern and central parts of the country. Thousands of people were evacuated as a precaution in the largest post-war evacuation ever to take place in the country. However, the dikes were able to withstand the high water levels on both occasions. The reaction to these near disasters of 1993 and 1995 was a traditional Dutch one – a mobilisation of all necessary resources to strengthen and enlarge the dikes and dams. By the late 1990s, the political climate had changed and anxiety about possible flooding had somewhat waned. Around the same time, the issue of climate change emerged. Some doubts were expressed about the appropriateness of traditional approaches to water management, and questions were raised about whether raising the height of the dikes and other traditional engineering approaches, such as pumping water out of low-lying areas, would be sufficient to counter the effects of climate change. A government commission was established to advise on water management issues in the twenty-first century, known as the Commission on Water Management Twenty-First Century (*Commissie Waterbeheer 21e eeuw*).

One of the core conclusions of the commission was that there was a need to develop a closer relationship between water management and spatial planning. Two key recommendations were made. First, the maintenance of the water system should provide the preconditions for planning. The underlying assumption of this recommendation was that spatial development had had a negative impact in the past on the capacity of water systems to handle large fluctuations in water and that this needed

to be changed. Second, the Netherlands had become more vulnerable to flooding because the majority of development had taken place in the low-lying areas that are the most susceptible to flooding, and consequently, the commission recommended that all land-use decisions needed to take into account the effects of development on the water system. In 2003, the "water test" was made a statutory requirement for assessing planning documents, providing an important mechanism for integrating water concerns into the planning process and consultations between the planning authorities and water authorities. However, such an approach proved to be complicated in the institutional context, as the water boards occupy a separate functional tier of government with their own elected councils.

While the governance of adaptation and mitigation to climate change is relatively new, certain elements have been in place in the Netherlands for centuries under the long-established arrangements for water management, with administrative cooperation between local communities to manage water evident even in the Middle Ages. The precursors to the contemporary Dutch water boards (*waterschappen*) were formed in the thirteenth century, and before the end of the eighteenth century (in 1798), the national water agency (*Rijkswaterstaat*) had been established, which is now an executive agency of the Ministry of Infrastructure and Environment, primarily responsible for managing national waterways and coastal defence.

13.3   Rotterdam's Vulnerability to the Impacts of Climate Change

Rotterdam is one of the leading cities in the Netherlands in the field of climate change adaptation initiatives (van den Berg 2010). As the second city in the Netherlands with a population over 500,000, Rotterdam is one of the most highly urbanised parts of the country. It also contains the port of Rotterdam, situated at the confluence of the River Maas and the North Sea, which is not just of major regional and national importance as the largest port in Europe, but as one of the largest ports in the world, it has also European and global significance.

Much of the city region of Rotterdam lies at an altitude not much higher than the mean sea level.[1] Since climate change is predicted to increase both the severity and number of floods, huge investments are planned for development in the low-lying parts of the region. Rotterdam's "city vision" for 2030, for example, identifies several areas for substantial new development in the low-lying parts of the city that are currently unprotected by dikes.

Climate change is expected to affect this urban coastal delta in numerous ways. Sea-level rise is expected to be a major disturbance, particularly if combined with

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[1] The average elevation of the area is approximately +3.25 m above Amsterdam Ordnance Datum (NAP) with some parts as low as +2.50 m NAP, which results in limited flooding typically once or twice a year.

possible changes in storm surge conditions. These can increase the frequency of flooding and risks in these already flood-prone neighbourhoods. Other disturbances include higher temperatures in the summer and lower river levels, which may lead to problems related to electricity and drinking water supplies, and water and air quality. According to scenario studies, the strength of the heaviest storms is projected to increase, which will increase flood risks, during which port activities may need to be halted. Higher sea levels will mean that the Maeslant storm surge barrier will need to be closed more often, and as a result, river discharges into the sea will be blocked more frequently and additional capacity may be needed to retain extra river water temporarily. Occurrences of heavy rainfall are also projected to increase, which could result in flooding if the capacity of the drainage system is exceeded.

13.4 Manifestations of Resilience in Rotterdam's Planning Policies

Before examining for the presence of resilience concepts in planning policies in Rotterdam, this section begins by outlining the national policy, which has experienced significant change over recent years with a flurry of interrelated policy documents on spatial planning, climate change and water management since 2006. There is of course also an important international context to resilience (both European and global), especially in relation to water management, climate change, and adaptation and mitigation issues. The supranational context is, however, excluded from the account below for the simple reason of brevity and simplicity.

13.4.1 The National Context

In the 5-year period between 2006 and 2010, a series of national policy documents with features of resilience were published in close succession, signalling a significant shift in the direction and emphasis of Dutch policy on planning, water management and climate change. The beginning of this period (2006) was marked by the approval of a new national spatial planning strategy (*Nota Ruimte*) as well as a new Spatial Planning Act (*Wro*).[2]

In January 2006, the National Spatial Strategy was approved by the Senate, setting out the government's vision for spatial development in the Netherlands and the framework for national planning policy up to 2020. The document identified the issue of water as one of the main guiding principles for spatial development (i.e. one of the essential starting points in the process of spatial planning). A similar approach

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[2] The new National Spatial Planning Act came into effect on 1 July 2008, replacing the previous act from 1965.

had been proposed in the Fifth Note on Spatial Planning (published in 2001), but this never entered into force due to changes in the national political landscape (Priemus 2004). On the issue of climate change, the National Spatial Strategy had significantly more to say than preceding spatial planning policy documents. The 2006 strategy recognised "major implications for the spatial development of the Netherlands" as a result of climate change, including the impacts of flooding and water shortage. According to the strategy, radical changes in water management were necessary under the threat of rising sea levels and greater extremes in rainfall and drought periods, especially in combination with ground subsidence and urbanisation in the low-lying western part of the country. These new approaches to water management have presented some important implications for spatial development, such as the ways in which new urban areas are developed in the future.

The 2007 Programme on Climate Adaptation and Spatial Planning underlined the importance of planning as a means of addressing climate change issues, calling for more attention to be given to the consequences of climate change, such as rising sea levels and greater river discharge volumes. Adaptation to climate change is largely a spatial issue, according to the programme, and climate proofing in the Netherlands represents one of the most important spatial challenges of the current century. Highlighting the need for mitigation alongside adaptation measures, the programme argued for solutions that *"combine mitigation and adaptation as effectively as possible"*. The programme recognised that, while mitigation relies on a global approach with global effects, adaptation is predominantly local or regional in scale. The concept of resilience also appeared several times in the programme; one example being the need for *"resistance, resilience and adaptive capacity"* to promote climate-proof planning – resistance in order to withstand extreme conditions; resilience in order to recover quickly once conditions return to normal; and adaptive capacity to cope with uncertainties, particularly related to the extent and pace of climate change. Resilience was thus considered in this programme to be about recovery and the speed at which it occurs. The Dutch coastal defence system, according to the document, provides an example of high resistance and low resilience – it is able to withstand storm tides and heavy storms, but if the system fails, it will take a long time to restore it to its former state.

In September 2007, the national vision for water management (*Watervisie*) was published, in which long-term "climate-proof" policy guidelines (to increase capacity to "withstand the effects of climate change") were set out, defining both adaptation and mitigation measures as central pillars. The vision argued that greater efforts were needed to cope with the effects of climate change (i.e. adaptation) in addition to government efforts to make the energy economy of the Netherlands more sustainable and to reduce CO_2 emissions (i.e. mitigation). In line with the 2006 National Spatial Strategy, the national vision for water management highlighted the importance of water issues in planning, arguing that water must be a more decisive factor in decision-making on major issues in the fields of urbanisation, economic development, industry, nature, landscape and recreation. Physical infrastructure investments, such as for roads, urban networks and ports, also need to be climate proof, the vision argued, so as to reduce the vulnerability of the Netherlands. The document also

announced actions to identify new principles for climate-proof development as well as a set of criteria to ensure that the effects of climate change are factored into decisions on major development projects and investment programmes.

In parallel with the development of the national vision for water management (see above), the National Adaptation Strategy was also developed in 2007, involving collaboration between four ministries (Housing, Spatial Planning and the Environment; Transport, Public Works & Water Management; Agriculture, Nature and Food Quality; and Economic Affairs) as well as umbrella organisations representing the provinces (Association of Provincial Authorities), municipalities (Association of Netherlands Municipalities) and water boards (Association of Water Boards). Approved in November 2007, months after the national vision for water management, the programme closely echoed various messages contained within the water vision. The rationale for the programme was that even dramatic reductions in current emissions are insufficient to prevent climate change, as adaptation measures, in parallel with mitigation actions, are also required. According to the document, even if the emissions policy achieves the desired result in the short term, adaptation measures will still be needed.

In the same month as the publication of the national vision for water management, the Cabinet appointed an expert committee, the "Delta Commission", with a mandate to formulate a vision for the long-term protection of the Dutch coast and its hinterland. The severe flooding in 1953 prompted the appointment of the first Delta Committee to advise the government on how to protect the country against flooding (see above). The appointment of the second Delta Commission in 2007, on the other hand, was not in response to a serious disaster, but rather to address the serious threats originating from climate change. The mandate of the new Delta Commission was therefore broader than that of its predecessor. While the 1953 Commission was primarily concerned with engineering solutions to address an acute threat, the 2007 Commission was tasked with making recommendations on how to protect the Dutch coast and the low-lying hinterland against the consequences of climate change or, in other words, how to make the Netherlands "climate proof" in the long term: in short, providing protection against flooding while keeping the country an attractive place to live, reside and work. The Commission was asked to look beyond water safety alone, and consequently it also examined the links between water and residential, employment and recreational activities, as well as agriculture, the natural environment, infrastructure and energy. A year after being formed, the Commission published its recommendations in September 2008. The Commission's report stated that climate change poses some major adaptation problems for the Netherlands and has implications for the organisation of the entire country. As a consequence, spatial planning will have to adapt, the Commission argued, implying that land uses have to be better integrated and that water needs to be a guiding principle for development. In other words, planning and development need to be organised as far as possible in accordance with natural processes. The Commission recommended that flooding should be managed by a combination of measures that either lower the risk (such as higher and stronger flood defences) or reduce the impact of flooding (such as the regulation or zoning of land uses, the

compartmentalisation or containment of areas liable to flooding and the development of early warning systems). It was also recommended that all development decisions should be based on a full cost-benefit analysis that includes the present and future costs for all parties involved. The view of the Commission was that passing on the costs of local decisions to another administrative level or to society as a whole would be unacceptable, stating that the costs must be borne by those who benefit the most. The Commission's report (known as the *Delta Report*) also highlighted the specific case of Rotterdam where issues of flood protection and spatial planning are particularly important, "[h]igher discharges combined with sea level rise have consequences for flood protection at 'critical' locations, such as Rotterdam and other towns in the Rhine delta area, as well as for the land use and spatial planning" (p. 29).

In September 2008, a "structural vision" for the Randstad (entitled *Randstad 2040*) was adopted as part of the government's "Randstad Urgency Programme", aimed at speeding up decisions on priority investment projects (van der Burg and Vink 2008). Randstad 2040 was developed according to the 2006 Spatial Planning Act, requiring all governments (national, regional and local) to present spatial policies for their territories in their structural visions to outline the future spatial development of their area and to explain how the development is to be achieved. According to van der Burg and Vink (2008), there were two main reasons behind the preparation of Randstad 2040. The first reason was to add regional detail to the 2006 National Spatial Strategy (described above). The second was to look beyond the time horizon of the National Spatial Strategy, since investment decisions about large infrastructure and new housing development can easily extend beyond 2020. The plans presented in the Randstad 2040 structural vision were based on four guiding "principles", one of which concerned safety and climate resilience. According to the document, climate proofing and water management principles should guide the location, design and/or construction of urban locations, critical infrastructure and vulnerable developments. Recognising that the future, especially the long term, is uncertain, the vision highlighted the desire to make choices that are robust and flexible: robust in the sense that the choices will be useful even in the event of unforeseen circumstances and developments and flexible in the sense that the choices should allow room for adaptation to new ideas, knowledge and innovations on the way to 2040. In terms of water security, the vision identified a range of measures, including continued investment in both existing and new barriers (reinforcement of dikes), more space for the drainage and disposal of water and improving public awareness of water and its risks.

The National Water Plan, adopted by the Cabinet in December 2009, outlined the government's water management policies to be implemented in the period from 2009 to 2015. As the successor to the Fourth National Policy Memorandum on Water Management of 1998, the plan elaborated the recommendations of the 2008 Delta Commission (see above), mainly focusing on flood protection and water supply issues. Echoing similar statements from the Delta Commission's 2008 report and the Randstad 2040 structural vision (see above), the National Water Plan called for greater attention to water in decisions concerning urbanisation, commerce, industry and agriculture, nature, landscape and leisure activities in order to achieve more

sustainable and climate-proof development. Providing more space for water was one of the key proposals for withstanding the consequences of climate change. Spatial reservation, according to the report, can play a key role in the maintenance of the water system, and this must be reflected in local planning policies. The water plan highlighted the fact that areas outside the dikes (unlike the areas inside the dikes) are not subject to legal standards for protection against water, with the basic assumption being that the inhabitants and users themselves are primarily responsible for taking mitigating measures and should bear the risk of any water damage, which is of specific relevance to many parts of Rotterdam (see below). Explicit reference to the issue of resilience can be found in the document, which contends that a water system *"is more robust when it makes use of or gives room to natural processes, as natural systems offer resistance to disruptions themselves and possess a degree of resilience that allows them to continue to function after a disruption and to either recover or adapt to altered circumstances"* (pp. 75–76). Climate mitigation and adaptation issues can also be found in the plan. According to the document, *"there is broad international recognition of the fact that, apart from counteracting climate change [mitigation], it is also very important for sustainable development to adapt and move along with it in order to limit the consequences for society [adaptation]. Solving water issues will be central to global adaptation to climate change"* (p. 242).

13.4.2   *Resilience in Local Plans*

The local level of planning (performed by different local organisations such as municipalities, semipublic organisations and public corporations) is closely linked to national planning strategies. Towns and cities bear primary responsibility for the implementation of urban policy in collaboration with central government. Cities are expected to formulate their own goals in a long-term development programme, while central government awards special-purpose grants to the cities, providing substantial financial resources. Cities can spend the money freely within designated sectors and can tailor these to local conditions. In this respect, the central government plays a crucial role in Dutch urban policy (Taşan-Kok 2010).

Rotterdam's Port Vision, produced by the city of Rotterdam in cooperation with the port of Rotterdam and the Rijnmond Environmental Protection Agency, was adopted in 2004 and set out a framework for future spatial and economic development in the port of Rotterdam, an area that covers approximately 10,500 ha and extends almost 40 km along the River Maas from the city centre of Rotterdam to the North Sea. The vision was developed around three objectives: (1) to reinforce the international competitive position of the port and industrial complex, (2) to strengthen the economic structure of the city and region, and (3) to contribute to a better residential and living environment in the region. While general environmental issues clearly form part of the third objective, more specific references to issues such as climate change, resilience, adaptation or mitigation are absent from the document. The main environmental issues considered in the Port Vision

were noise, nuisance, hazardous substances and water quality. Protecting the port against flooding was mentioned in the document but only as a subject for future investigation.

In 2005, the Regional Spatial Plan for Rotterdam (2005–2020) was adopted and covered both the city of Rotterdam as well as its adjoining municipalities. The document had three main policy goals: (1) to improve the quality of residential environments, (2) to strengthen and diversify the economic structure of the city, and (3) to increase social cohesion. In contrast to Rotterdam's Port Vision (adopted in 2004), the Regional Spatial Plan contained several direct references to climate change, mainly in relation to water management issues. The plan noted, for example, that climate change *"requires exceptional responses in order to keep the region protected against flooding and water shortages"* with the consequence that, in some areas, *"waterways will need to be widened and polders will need to be adapted for the temporary storage of excess rainwater (peak storage)"* (p. 48).

In 2007, the Urban Vision for Rotterdam up to 2030 was adopted, in which the future direction of desirable development for the city was presented. The document set out plans for future spatial development in the city, targeting a strong economy with more jobs and an attractive environment for living and working. Climate change received little attention (being mentioned just once) in this document of more than 160 pages, noting only that a large number of areas in Rotterdam inside the dikes are facing a serious shortfall in water storage capacity and that this problem will only be increased by climate change and further urbanisation in the city. No references to adaptation or mitigation issues (or resilience) were contained in the vision.

The Rotterdam Water Plan (*Rotterdam 2 Waterplan*), also adopted in 2007, described how the city of Rotterdam and the water board would deal with water in the city in the future. The issue of climate change was substantially more prominent in this report than the Urban Vision for Rotterdam. According to the report, climate change is becoming increasingly evident, and this is likely to have some major consequences for Rotterdam. The plan distinguished between two broad types of measures to respond to climate change. The first (termed "hardware") concerns flood protection and includes modifications to dikes, barriers and other water protection structures, while the second concerns flood resistance (termed "software") and includes "waterproof" design and construction processes for development. The latter (making the city more "waterproof"), according to the report, will require new approaches to water storage, water quality and water protection, paying specific attention to development in Rotterdam outside the dikes (i.e. areas not protected from higher river water levels), noting that these areas present an important development opportunity for attractive new residential areas on the river. However, the location of these developments (and their vulnerability to higher river water levels) requires that designs will need to closely consider adaptation options, such as raising the ground level for development or more innovative methods, such as floating structures.

The year 2007 also saw the establishment of the Rotterdam Climate Initiative (RCI), which involves collaboration on the issue of climate change between the port of Rotterdam, the city of Rotterdam, the Rijnmond Environmental Protection

Agency (DCMR) and a group of local employers (Deltalinqs). The initiative arose in response to agreements to reduce carbon emissions and increase energy efficiency in large cities across the world, supported by the Clinton Climate Initiative and the Large Cities Climate Leadership Group (since renamed C40). Alongside a climate reduction target (50% reduction of CO_2 emissions by 2025 compared to 1990 levels), the RCI also has the ambition of increasing the city's resilience to climate change and becoming a leading city in water innovation. As part of the initiative, various activities aimed at making Rotterdam more "climate proof" have been implemented, which are itemised in the RCI's annual programme, entitled "Rotterdam Climate Proof". The top priority in this regard, according to the 2009 *Rotterdam Climate Proof* report, is protecting the city and port against flooding, both inside and outside the dikes. The report announced the intention to ensure that all future climate developments are anticipated and reflected in future spatial plans, implementation projects and management activities from 2012 onwards. The *Stadshavens* area of Rotterdam, which mainly consists of industrial harbour areas that are entirely outside the dikes (see below), received special attention in the Rotterdam Climate Proof programme due to its location and the fact that the area offers substantial potential for new development in the city. According to the report, climate resilience and sustainability are essential preconditions of any development.

Produced in 2010 for the Rotterdam Climate Initiative and the Rotterdam Climate Proof programme, the Rotterdam Sustainability Guide (*Rotterdam Duurzaam Wijzer*) was aimed at assisting designers, project managers and policymakers in translating sustainable concepts into practice in the specific areas of climate adaptation, energy use, transport and mobility, rainwater, the use of materials and green space. For each of these six areas, the sustainability guide identified practical examples of development options at regional, urban, neighbourhood and building scales that might contribute to sustainable urban development. On the issue of climate adaptation, the guide identified three ways in which development can contribute to more climate-proof development: (1) measures that minimise the *probability* of flooding, (2) measures that minimise the *consequences* of flooding, and (3) measures that stimulate recovery from floods (Table 13.1).

In the specific case of the *Stadshavens* area of Rotterdam, recent plans from 2011 have been produced that refer directly to the issues of climate change and resilience. This is perhaps unsurprising given the area's location entirely outside the protective dikes, making it much more vulnerable to flooding than other parts of the city. The structural vision for the *Stadshavens* area (*Ontwerp Structuurvisie Stadshavens Rotterdam*) was approved in 2011 and is a mandatory plan that describes general planning policies for the area up to 2025 while also considering certain development issues up to 2040. Climate-proof development accounted for one of the ten development principles for the area, which, according to the structural vision document, is an important prerequisite for a sustainable business and residential environment. The key focus, it argues, must be on measures that increase both *resistance* (i.e. reducing impacts) and *resilience* (i.e. reducing the effects of the impacts).

Table 13.1 Development options for climate change adaptation from Rotterdam Sustainability Guide

	Minimising probability	Minimising consequences	Stimulating recovery
Region	Improved dikes New Delta plan Cool recreational opportunities	Compartmentalisation between dikes Flood risk maps Early warning system Evacuation plan	Priority for recovery from social disorder Emergency shelters
City	De-hardened and greened surfaces Public green and water zones Room for innovative storage Avoid vulnerable functions in vulnerable areas	Alleviated public infrastructure Adopted traffic management during evacuations Heat stress plan	Priority for recovery of public space Accommodation of heat stress victims Water nuisance fund Backup energy and water systems
District	Buildings integrated into dykes Integrally heightened areas Collective green gardens Rainwater infiltration systems, wadis[a]	Safe havens Green walks Elevated sidewalks	Passive water drains
Building	Green frontages Permanent cooling options Buildings on mounds	Wetproof ground floors Dry-proof ground floors Sun blinds Self-reliance	Availability of pumps Wetproof decorations

Source: Adapted from Municipality of Rotterdam (2010)
[a]Drainage channels

13.5   Discussion and Conclusions

This chapter has argued that urban resilience is concerned with both adaptation and mitigation, and it has been shown how Dutch climate change policy has experienced a shift from one dimension of resilience to the other. The analysis of recent policies on spatial planning, water management and climate change (as well as discussions with policy officials at the national and subnational levels) reveals that the concept of resilience has recently begun to feature in policy-making not only at the national level but also at the local level, as illustrated in the case of Rotterdam. Nevertheless, a number of different interpretations of the concept are apparent within policy documents (and between policy officials). In general, urban resilience is often interpreted more heavily in terms of adaptation than mitigation, and this is true at both the national and local policy levels. At the local level, the greater emphasis on adaptation policy is not entirely surprising since mitigation is often considered to be a matter for national or international policy-making, whereas adaptation measures, on the other hand, are often seen as local (Biesbroek et al. 2009). The greater emphasis on adaptation than mitigation at the national level is more surprising, but as can be seen in the analysis of recent policies, this is the situation that appears to have emerged. One explanation for this is outlined by de Vries (2006:227), who argues that *"it is inherently more difficult to gain support for mitigating measures than for adaptive measures"* in a country like the Netherlands and that it is often *"easier to accept that climate change is unavoidable than to be convinced that changing your way of life in a small country will have a serious impact on global climate change"*.

Although some policy documents can be found that refer directly to the concept of resilience, more of these documents discuss climate change, adaptation and/or mitigation without referring to resilience. Given that resilience is a relatively new policy concept, what is surprising is that the concept occurs as often as it does in current policy, both at the national and subnational levels. The term seems to have entered into policy relatively quickly in the Netherlands in comparison to many other countries, which may in part be due to the vulnerability of the country to climate change. Nevertheless, urban resilience remains a fuzzy concept both at home and abroad, which may of course be due to its relative immaturity, meaning that more clarity may emerge in the future. However, this is not to say that the concept is too vague to be of practical use. As Lagendijk (2003) suggests, fuzzy concepts can be useful because they can provide focal points for internal debate and *"contribute to teaching and dialogue with other disciplines and policy making"* (p. 726).

Changes in the political landscape of the Netherlands at the turn of the twenty-first century provide one explanation for the emergence of so many policy documents on spatial planning, water and climate change over the last decade, with the increasing global interest in climate change issues providing another explanation for changes in policy. Irrespective of the reasons behind the policy changes, several observations can be made about the nature of these changes. In short, issues of climate change (especially issues concerning flooding and water management)

are increasingly being advocated as being central to spatial planning decisions. As a consequence, more attention is being given to water in Dutch planning. Dutch climate change mitigation policies and actions, many of which predate the turn of the twenty-first century, have recently been supplemented by the introduction of adaptation policies. The notion of resilience in an urban context (or urban resilience) can already be found in a number of policy documents in the Netherlands – sometimes explicitly, and elsewhere more implicitly. Differences in the way the term is used and construed in policy are apparent. According to interviews with policy officials carried out by the authors, there is a broad range of interpretations of the concept among public officials dealing with spatial planning, climate change, and adaptation and mitigation issues.

The importance of climate change for spatial planning in the Netherlands has been elevated since the turn of the twenty-first century, notably since the publication of the National Spatial Strategy in 2006. Although the status of water in planning may have been elevated, there is of course no guarantee that this has influenced development patterns. Wolsink (2006), for example, contends that *"water is [officially] proclaimed as an ordering element, yet actual spatial developments still follow lines of economic and social priorities"* (p. 473).

Several recent national policy documents make explicit reference to resilience, although differences in the interpretation of the concept are apparent. The 2007 Programme on Climate Adaptation and Spatial Planning, for example, refers to the concept of resilience several times, including references to the need for *"resistance, resilience and adaptive capacity"* to promote climate-proof planning. Resistance is used here as a synonym for the ability to withstand extreme conditions, while resilience refers to the speed of recovery. It bears close similarity to the second of the two main dimensions of urban resilience discussed above.[3] Resistance is considered to be important for climate-proof (or resilient) planning, but does not appear to be considered as part of the concept of urban resilience. The 2009 National Water Plan also makes explicit reference to the concept of resilience, where it is again seen in terms of the ability to recover from disruption, while resistance is considered as complementary to resilience but somewhat separate from it. References to resilience can also be found in some local policy documents for the city of Rotterdam from 2005 onwards. In common with the way in which it is defined in national policy, resilience is frequently considered as being primarily concerned with adaptation, while mitigation and resistance (i.e. reducing impacts), on the other hand, are rarely considered in policy to be part of the concept of urban resilience. This is evident, for example, in the structural vision for the *Stadshavens* area, which distinguishes between policy measures that increase *resistance* to disruption and those that promote *resilience*.

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[3] The two main dimensions of urban resilience discussed above are (1) the system's robustness (or its strength to withstand disturbance) and (2) the speed with which this recovery of function is achieved (or flexibility of response).

Although not explicit in policy, the development of no-regret measures (i.e. measures that are effective under a range of possible future conditions) is a crucial part of resilient decision-making. After all, the whole thrust of the concept of resilience is that systems (whether ecosystems, individuals, organisations, cities or regions) need to be able to cope with change, both in terms of minimising disruption and maximising the rapidity of response. An interesting example illustrating the importance of implementing no-regret measures is highlighted in the structural vision for the *Stadshavens* area. Preparations for a climate adaptation programme in the Rijnmond-Drechtsteden Delta[4] (which encompasses the *Stadshavens* area) may have significant potential implications for future development choices. A variety of different options is being considered for water management in this delta area, ranging from a fully open water system to one which is completely closed. The various options under consideration will have different implications for water levels (and their fluctuation), and by consequence, these water management options will also have implications for the layout of development and the required height of dikes. Because a final decision on the preferred water management strategy for the delta area will probably not be made before 2014, the structural vision highlights the importance of implementing no-regret measures.

The flexibility in decision-making in cities also forms a crucial part of urban resilience. This point can also be illustrated using the case of the *Stadshavens* area, where most development decisions are made by the municipality (the competences for development decisions in areas outside the river dikes are currently under debate in the Netherlands). The current development policy in the city of Rotterdam prescribes minimum standards for the height of the ground relative to high water levels on which development can take place. If the ground level is too low, the area cannot be developed unless the ground is first raised. This process can be very costly and does not differentiate between land uses and the different levels of protection they require. In response to this, the structural vision proposes new guidelines for development, including a differentiation between building types, where vulnerable buildings and land uses (e.g. residential development) are given more protection against flooding than less sensitive buildings and land uses (e.g. parks or industrial storage). In other words, acceptable flood risks are higher in some places than in others. In addition, because flooding is only likely to occur at high tide and will never last more than a few hours, various development options are proposed that may be able to cope with these risks. Examples cited in the structural vision include "dry-proof" development, where public spaces can be flooded without damage and allow buildings to stay dry, and "wetproof" building techniques, where water cannot easily penetrate buildings.

Spatial planning has the potential to combine adaptation and mitigation measures and to ensure that these measures are complementary, and this is where attention needs to be focused in spatial planning in the future. Having said this, it is also

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[4] Preparations for a climate adaptation programme in the Rijnmond-Drechtsteden Delta involve cooperation between national and regional governments.

important to recognise that resilience is not just about planning and land use, as it also needs to take people, and how they act in urban areas, into account. In other words, urban resilience should be concerned with the physical environment but also with social and behavioural dimensions. After all, the ability of cities to respond and change to threats and disruptions has a strong social component (related to the idea of social capital) in addition to the form and layout of cities.

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Chapter 14
The Evaluation of Findings and Future of Resilience Thinking in Planning

Ayda Eraydin and Tuna Taşan-Kok

14.1   Introduction

The mission of the planner has never been as frustrating as it is today. While planning practice is littered with such terms as democratisation, participation and collaborative decision making, most planners have strong doubts as to whether they are fulfilling their primary mission, that is, to prepare cities for the future. Their role today has rather become one of solving daily problems to satisfy the interests of the dominant actors in the urban system.

In the 1970s, sustainable development was a new approach that reminded planners of their responsibilities – to target economic and social development while also recognising the needs of all living organisms and the earth. The excitement and enthusiasm brought by the sustainability concept, however, has faded since the 1980s under the increasing dominance of the neoliberal ideology, neoliberalisation and market-friendly policies having affected the way cities develop and function since the late 1970s. Competitiveness, globalisation, networking, innovativeness and creativity formed the bases of the new practices, bringing legitimacy to a number of urban projects that in previous periods had been frowned upon. Serving the real

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estate market became the core area of interest in planning, and short-range fragmented projects dominated planning practice. In an increasingly competitive world economy, marketing cities and creating global cities as nodes of the global economic system became a target all over the world, inspired by the exaggerated experience of a small number of cities, with little regard as to whether such an approach was relevant for them or not. The benefits have been widely discussed with only scant regard for costs and the social and environmental consequences; recently, however, several criticisms have been raised on the ideology of neoliberalism and the planning representing this ideology (Harvey 2005; McGuirk 2005; Peck et al. 2009; Purcell 2009; Taşan-Kok and Baeten 2011).

The increasing criticisms found strong support in the increasing number of economic and ecological crises that have been experienced in recent years, which were accepted as signals that the market mechanism that dominated policymaking and planning practices was failing to prepare cities to tackle unforeseen disturbances. The aftermath of the crises showed that even places that were thought to be very robust were in fact not, increasing the frustration with the ongoing policies and planning practices.

The emergence of the concept of resilience at this time fostered a second wave of enthusiasm among academicians and some policymakers, emphasising "new adaptive strategies to manage and cope with change while sustaining their main functions". This was seen as an attractive solution and was quickly joined by "not only sustaining their main functions, but adopting new innovative strategies and becoming even stronger after the crisis". In other words, "gaining from the crisis" became the new way of perceiving the "resilience" concept. This change showed that the term resilience, which originated in the ecological sciences field, had now found a home also in the field of urban studies. Resilience is still not well established and is rather a fuzzy concept in urban studies since it has been adopted from other fields. However, as indicated in Chap. 3 of this book, it may become more defined when used not only in theoretical debates but also in research, especially in case studies.

This book attempts to decode this concept and to explore how it can help planners to overcome their agitation and frustration about the future. It would be unrealistic to claim that the book provides all the necessary answers for the creation of a new planning approach based on resilience; however, what can be suggested is how this new conceptual construct can be used in planning practice.

What the resilience approach offers is not completely new, as emphasis is on the instinct that has always been at the heart of planning, that is, to follow a systematic approach by contemplating the interactions between the components of the urban system. What can be considered new here is its suggested use as a "mind frame" when analysing existing systems and understanding that an impetus of change can result in different outcomes depending on a series of interactive impacts.

As defined in Chap. 2, urban land-use planning is traditionally more concerned with attempting to minimise disturbance and reduce the risks and the negative effects of possible disturbances. Resilience thinking first extends the remit of planning to include disturbance as an integral part of the planning process and suggests a shift in priority from those that aspire to *control* the change to those that increase

the *capacity* of the system to cope with, adapt to and shape change. The idea is to accept the fact that changes are going to take place, and while taking steps to reduce the risks, urban systems should be prepared to absorb these changes, reorganise themselves and develop new adaptive strategies to manage and cope with the change while improving their capacities.

It has taken some time for the resilience concept to become integrated into planning debates. As summarised in Chap. 3, the evolution of the definition of resilience in urban planning literature has followed a three-stage path: Firstly, *system resilience* appeared as a concept in social sciences; secondly, the *resilience of cities* as urban (ecological, social and economic) systems came under scrutiny, and a wide body of literature on social, economic and ecological resilience of urban systems began to accumulate; and finally, urban planning literature began to seek *principles to plan for a resilient city*, while the emphasis shifted from coping with environmental hazards towards a more comprehensive approach that looked at the resilience of the urban system as a whole, considering economic, social and ecological disturbances as integrated parts of the system.

The *disturbance* concept plays an important role in defining the resilience of a system. Although radical disturbances are mainly associated with environmental disasters and natural hazards, for urban systems, political, social and economic disturbances (financial crisis, political turbulence or public unrest) can be the main source of vulnerabilities. For this reason, economic and social resilience has also appeared as an important dimension in the sustainability of cities. Social resilience is about building institutions for social reorganisation and collective action, robust governance systems and a diversity of livelihood choices (Adger et al. 2005), while economic resilience is connected to coping with the slow and/or radical changes that result from the interaction of endogenous and exogenous economic and other related processes.

Within the evolution of debates, it is the attribute of resilience that has received the most attention. Previous literature has defined several attributes of resilience with the intention being to identify the measurable characteristics of resilient cities and the capacity of urban systems. According to Godschalk (2003), these attributes include *redundancy, diversity, efficiency, autonomy, strength, interdependence, adaptability* and *collaboration.* A resilient city is expected to be able to adapt to uncertainties through combinations of these attributes (Godschalk 2003; Fleischhauer 2008). Walker and Salt (2006) refer to these characteristics as "qualities", adding to them a social dimension. According to them, the main qualities include *diversity, ecological variability, modularity, acknowledging slow variables, tight feedbacks, social capital, innovation, overlap in governance and ecosystem services.*

The cases presented in this book (see Chaps. 9, 10, 11, 12, and 13) illustrate that some of these qualities can actually increase the resilience of cities against a wide range of vulnerabilities and include *recovery, connectivity, capital building, adaptability, robustness, flexibility, self-organisation and transformability*, which are defined in Chap. 3 and also tackled in the case study chapters. These attributes enable an urban system to be resilient in response to changes and retain its advantage, although for some of them, there is no such consensus, such as for connectivity.

Although most of resilience attributes have been inherited from the sustainability debate, as argued in Chap. 4, resilience attributes are different to the attributes of sustainability, as some new features are considered and may have different interpretations and assumptions. Moreover, sustainability and resilience do not always work in the same direction. For example, policies promoting high-density mixed-use settlements and compact cities can reduce energy demand and transport emissions, although they may intensify the urban heat island effect and may pose problems for urban drainage (McEvoy et al. 2006). Furthermore, the intensification of the core areas of cities aiming at energy efficiency can inhibit natural indoor and outdoor ventilation (e.g. due to insufficient space between buildings) and is likely to lead to an increase in demand for ventilation and air conditioning, with additional impacts on climate change (Pizarro 2009). There may also be indirect effects as a result of people escaping uncomfortable conditions in cities, leading to increased transport emissions (McEvoy et al. 2006).

The main paradigm shift from sustainability to resilience lies in the consideration of urban areas as complex adaptive systems. Furthermore, studying urban systems means bringing the linkage between ecology and planning into the spotlight and investigating the most adequate spatial patterns or forms for dealing with adversities. However, one should keep in mind the complexity and variability of urban systems and recognise that there are different stages of equilibrium. Accordingly, what is considered as the best type of urban development or the best response to sudden environmental changes may evolve over time.

The studies included in this book represent one of the first attempts to discuss and integrate the resilience concept into research with respect to urban planning following a methodological approach that is tested on different case studies. Although an outcome of an international project, this book is not merely a collection of different papers with different perspectives; instead, it introduces a search for a new understanding of the dynamics of cities in the contemporary world and evaluates the planning practices that have been adopted and implemented in the recent past with a common perspective of "resilience thinking" by drawing upon the experiences of different case studies. This practice enables a discussion of resilience as a mind frame as well as a tool for planning with respect to the conceptual, methodological and contextual dimensions of such thinking.

14.2 Conceptual Contributions of Resilience in Planning: Resilience as a Mind Frame

The study introduced in Chap. 10 claims that urban policies should be prepared to provide guidance in resilience to deal with changes. If not, reaching a sustained level of development will be difficult, even if the policy instruments are implemented in detail. In this respect, the resilience concept provides a point of focus and a useful framework.

One of the main features of this framework is *treating urban areas as systems.* Is this a new approach? Not exactly. During the quantitative revolution in planning in the 1960s, system thinking was very popular (see Forrester 1969, 1987; Chadwick 1971). The main difference was that the 1970s system approach was focused on internal dynamics, taking certain subsystems and their relations into consideration, while the resilience approach shows that the external factors may be even more important than the components of the system. In fact, the novelty of resilience thinking lies in the importance of external dynamics that bring about important changes within the urban systems.

Planners, policymakers and the general public are all aware that cities are whole systems that constitute more than merely the sum of their parts. Cities can be seen as interconnected systems which may result in optimal or suboptimal outcomes. Moreover, external disturbances disseminated throughout the system may have a series of indirect impacts on each subsystem, some of which may be difficult to predict due to the multiplier effects of certain changes; and the nature of the existing resources may lead to different outcomes. The urban metabolism perspective is quite useful in the systematisation of the interconnections and in defining not only direct and indirect effects but also those that are induced (Resilience Alliance 2007). The urban metabolism concept is defined as "the sum total of the technical and socioeconomic processes that occur in cities, resulting in growth, production of energy, and elimination of waste" (Kennedy et al. 2007: 44). There are some studies that look at the sustainability of cities from this perspective and search for evidence of how the metabolism of an urban system may be disturbed, for instance, through a change in ground water levels, exhaustion of local materials, accumulation of toxic waste, summer heat islands, irregular accumulation of nutrients, etc. (Kennedy et al. 2007).

For this reason, there is a need for systemic thinking, taking the interactive processes among the subsystems and also the different subdivisions of an urban area into account. In Chap. 11, Eraydin, Türel and Altay Kaya claim that even between small parts of the metropolitan area, the level of adaptive capacity may vary considerably and that the adaptive capacity of one area may easily deteriorate the adaptive capacity of its neighbouring areas or even the metropolitan area as whole. This is true not only for environmental issues, but also for economic and social ones too.

These findings are important to show, firstly, that the scale of analysis is very important; secondly, that the relationships between the parts and the whole need to be carefully defined (Chap. 12 by Schmitt, Greve-Harbo, Tepecik-Diş and Henriksson provides a good illustration of this way of thinking, showing that the concept of polycentricity demands a high level of systemic understanding of the Stockholm city region in general, and its different regional urban cores in particular, with the help of a resilient perspective); and finally, how the impacts of a disturbance on one area may disseminate, which needs to be assessed carefully. Traditional planning mainly considers the first round of impacts, without taking the indirect affects into account.

The most important peculiarity of resilience thinking, however*, is long-term future simulation models*. What is striking in literature is that short-term decisions may have devastating effects on urban systems in the long term. As explained by

Taşan-Kok and Stead in Chap. 13, in some of the case study cities, namely, Lisbon, Oporto and Istanbul, planning according to different motivations increased the vulnerability of the cities because they were unable to predict the long-term consequences of their policies and plans, which was something that was addressed in the Dutch long-term planning perspective.

The five case studies in this book indicate that each city has different priorities, depending on its experience and inherited structural characteristics, as well as its own problems, and *each city has defined its own means and priorities* when facing unexpected changes. The most resilient cities are those that foster creative and innovative approaches to global challenges by designating their weaknesses and vulnerabilities. It is also important to define *no-regret conditions and measures* (i.e. measures that are effective under a range of possible future conditions) for resilient decision making. Flexibility in decision making in cities also constitutes a crucial part of urban resilience. In Chap. 13, this point is illustrated by Taşan-Kok and Stead using the case of the Stadshavens area in Rotterdam. The current development policy in the city of Rotterdam prescribes minimum standards for the height of the ground relative to high water levels on which development can take place. Where the ground level is currently too low, it cannot be developed unless the ground level is first raised. This process can be very costly and does not differentiate between land uses and the different levels of protection they require. In response to this, the Structural Vision (strategic plan of the city) proposes new guidelines for development, including a differentiation between building types, where vulnerable buildings and land uses (e.g. residential development) are given more protection against flooding than less sensitive buildings and land uses (e.g. parks or industrial storage). In other words, what is considered as an acceptable flood risk in one area may be completely different in another. In addition, because flooding is only likely to occur at high tide and never last more than a few hours, various development options are proposed that might be able to cope with these risks.

Achieving cities that are more resilient often requires a shift in infrastructure, investment and a *prioritising of public investment*. This can be done by prioritising funding for public transport, instead of solutions based upon individual car ownership, or improving rail transport within the urban system, as discussed in Chap. 9 by Dias, Morgado and Costa. They show that for the case of Oporto, public investment in transport development can increase the accessibility of a certain area; and increases in land values resulting from such public investment can often attract private development investment. As well as increasing the economic value of an area, focused public investments can also improve local economic activities and amenity values for the community as a whole. This emphasis on public investment is very important since from 1980 onwards, public investments in cities have dropped in almost all parts of the world, with priority shifting to market reliance and private investment as the new core of the agenda.

Lastly, the book suggests several *innovative and flexible solutions*. In Chap. 9, Dias, Morgado and Costa show that the intensification of connectivity of the Alcantra neighbourhood, as designated in the urban plans, increased the resilience of this urban region. In Chap. 10, where policy initiatives to address central Oporto's

declining urban population and increasing vacancy are presented by Oliveira, Martins and Cruz, urban rehabilitation instruments, such as lowering taxes in the intervention area (Baxia district) or providing different types of buildings, have been implemented to attract different demographic groups. In Chap. 11, Eraydin, Türel and Altay show that a flexible approach in encouraging foreign enterprises to locate in the case study area (Büyükdere Avenue) has led to the creation of new and diverse employment opportunities, making it possible to sustain the existing diversity of the resident population in a rapidly changing urban core. In Chap. 12, the *indicative regional planning* approach is investigated by Schmitt, Greve Harbo, Tepecik Diş and Henriksson, involving negotiations between municipalities and relevant stakeholders as a means of resilient governance. In Chap. 13, Taşan-Kok and Stead provide examples of *"dryproof"* development, where public spaces can be flooded without damage and allow buildings to stay dry, and *"wetproof"* building techniques, by which water cannot easily penetrate buildings.

14.3   Methodological Issues

It has been emphasised that an analysis of spatial dynamics is important for defining the attributes of resilience. The different spatial dynamics that may occur in urban development can be related to the concept of urban resilience, as we have seen in Chap. 4. There is evidence that some attributes of resilience are related to urban patterns and dynamics, although the context and local specificities may play an important role. It should be noted that most analyses of sustainable land use are also valid for the concept of resilience; however, the focus should be on the capacity to cope with disturbances, problems and adversities, which is essential when introducing a new perspective to the traditional paradigm of sustainable development.

The methodological framework introduced in Chap. 8 by Pinho, Oliviera and Martins allows an understanding of how far policies and plans can help to strengthen the resilience of urban systems. In Chap. 12, by Schmitt, Greve-Harbo, Tepecik-Diş and Henriksson, it is noted that the concept of urban resilience has particularly helped to enrich this analysis by focusing on the institutional responses and individual reflections on the hitherto unknown (until 2001) planning concept of polycentricity. In this context, attributes of resilience have special importance. In the case studies introduced in Chaps. 9, 10, 11, 12, and 13, the attributes of resilience of an urban system are explored with the help of a set of indicators, which allow an understanding of to what extent the built environment is transformed to meet the new conditions defined by global processes, together with the transformability of the economic structure under global market pressures. As the case study in Chap. 9 by Dias, Morgado and Costa exemplifies, the methodology highlights both the merits and the negative outcomes of the planning process. Dias, Morgado and Costa propose that *adaptability* can be achieved through intensified connectivity within the urban plans. In Chap. 10, Oliveira, Martins, and Cruz analyse *recovery* and *capital building* as important attributes in making the Baxia area of Oporto resilient to a decline in

population and the deprivation of the built environment. In Chap. 11, Eraydin, Türel and Altay Kaya show through a detailed study of selected indicators that it is possible to define the *adaptive capacity* of an urban system to respond to changing conditions. Transformation projects, new urban built-up areas and changes in the composition of activities are positive indicators of adaptability, although the cost of adaptation is clear on the labour markets and increasing income differentials, leading to increasing residential segregation. In Chap. 12, *adaptability, transformability* and *connectivity* were analysed by Schmitt, Greve Harbo, Tepecik Diş, and Henriksson, who concluded that polycentricity can help to increase a city region's robustness in the face of economic crises, the demise of specific sectors, urban sprawl, social segregation, climate change and environmental degradation. As Taşan-Kok and Stead showed in Chap. 13, *adaptation* can be achieved with long-term planning.

14.4   Contextual Issues

In the book, several contextual issues of resilience are highlighted, the first being related to urban form. It is difficult to claim that one form of city is superior to another, since especially in the major cities of Europe (at least in the case study cities), different spatial dynamics leading to different urban forms can exist at the same time (see Chap. 5). Defining a certain *urban form* as more resilient means an overgeneralisation of the simplistic relations, which may be difficult to observe in major global cities. In previous literature, cities have been recognised as sustainable if they have a compact form as opposed to a sprawling form; a high level of connectivity within their transport networks; a land use pattern that is well integrated with public transport, with options for walking and cycling; and defined areas of growth, or "town centres" that contain a mix of residential, commercial and recreational land uses. Internationally, there has been a resurgence of interest in the more compact urban form, while in contrast some recent documents, such as the European Spatial Development Perspective (European Commission 1999), advocate polycentric urban development as a more flexible and adaptive formulation of the built environment, and social relationships in the large urban regions with less environmental impacts.

These types of generalisations may be misleading not only due to the specificities of each case but also due to the danger of assessment at a general level, which fails to take into account the iterative processes. For example, Chap. 11 shows that how people travel within the urban system is more important than the urban form itself, given the vital relationship between transport and the economic, physical and social aspects of the city.

Travel demand management is a widely used tool for changing people's behaviour towards more sustainable forms of transport (Davis et al. 2007). The measures used are commonly divided into two types: "hard" measures, such as high-occupancy vehicle and bus-only lanes, tolls, road pricing, congestion charges, parking pricing

and fuel taxes, and "soft" measures, including land-use planning, parking policies, travel marketing and organisational travel planning. Because of the way individual urban areas vary in shape, and the varying cost and effectiveness of different measures, an integrated range of measures can be tailored to the specific region or city.

Resilient infrastructure is important for creating robustness and adaptability, which in turn help cities to become more resilient. As mentioned earlier, the robustness or strength of an urban system allows it to withstand stress and disturbance, while adaptability in an urban system allows it to respond to changing conditions and objectives. Resilient infrastructure makes greater use of more localised and diverse ways of providing different services (electricity, drinking water, storm water amelioration and wastewater disposal) while also building capacity to cope with the different risks and crises (R&D, academic institutions, research facilities, etc.). Chapter 9 by Luis, Morgado and Costa clarifies how important the infrastructure is for increasing the resilience of certain areas. There are other examples of this, such as the use of solar technology, giving homeowners the ability to generate their own electricity. This sort of infrastructure can reduce the scale of damage from extreme events to more localised levels, such as in the event of a power failure, resilient infrastructure design can restrict the outage to a few suburbs rather than across the whole city (Ministry of Environment-New Zealand 2008).

Improvements in urban quality support the adaptive capacity of urban areas. Chapter 10 by Oliveira, Martins and Santos Cruz provides an illustrative case of how rehabilitation can be important in creating positive impacts on urban areas. Quality urban planning and design results in places with a high level of use and value while also determining the nature of the spaces in which people interact within an urban form.

14.5   Towards a Research Agenda on Planning for Resilience

Despite the growing number of studies on urban resilience analysing how and under what conditions urban subsystems, institutions and other components of urban eco-systems adapt to and develop innovative solution in response to (un)expected threats, how resilience planning may be integrated into planning is an area that has received little coverage in academic circles.

This book has introduced the major principles of the resilience planning paradigm and has made a comparison with rational and communicative planning paradigms. Some exemplary case studies have been presented to introduce the diverse ways resilience thinking may be integrated into planning so as to ensure ideas and thinking is converted into firm action. Also, the different examples introduced in the book have shown the benefits in following an analytical approach, namely, identifying vulnerabilities and taking them as the focal point in an analysis of the adaptive capacity of urban subsystems, thus helping to define both the priorities and red tape in the decision-making process. These explanatory studies, which make an evaluation of the planning practices conducted in geographically delimited areas, raise questions

for future research and highlight several major challenges to adopting the resilience approach in planning. It is possible to define the major challenges under five headings:

First, there is a need for further research into the benefits of adopting a systems thinking, which focuses on the whole, not the parts, of a complex urban system and defines the impacts of interactive relations, interfaces and arrangements among the components of the urban subsystems. As urban planning not only deals with ecological but also economic and social subsystems and metabolic flows, this is not an easy task. Still, understanding the co-evolutionary dynamics of urban systems and defining the substance of planning accordingly are vital for resilience planning. This research shows that different urban systems have different organisational capacities to adopt a systemic approach, meaning that some systems with a high organisational capacity will adapt to the new situations and cope with the threats much faster and more effectively than others. For some systems, using a systems approach requires changing the basic construct of organisational and institutional bodies before making future plans. In such complex systems, is it possible to understand the existing relationships among the components of the urban systems and define how they will evolve in the future? And how can such an understanding be enhanced?

Second, there is need to define the critical nodes of urban systems when adapting to change and building transformative capacity, which also necessitates systemic and long-term thinking. However, the identification of the critical issues and the priorities among them needs further clarification. How are planners able to define the critical issues; and are they, in fact, in a position to define critical issues or priorities in the complex field of political decision making? How far do the critical issues defined by studies of technical departments lead to planning decisions? Do we really need societal perception types of studies to define critical issues and vulnerabilities?

Third, there is need to find ways to define short- and long-term priorities. This requires a multilevel governance approach in which the roles and responsibilities of decision-making bodies are clarified. This research has shown that, especially in the public sector, if the tasks and responsibilities are not made clear, each public organisation tends to make its own plans and programmes according to its own priorities. In times of need, a lack of coordination in ideas will be an obstacle in the way of making a clear decision on how to address the threat. Moreover, how economic, social and ecological priorities can be matched with those that are technical and social in nature is one of the questions that are important in transforming resilience thinking into practice.

Fourth, introducing a value system is important when setting principles for the creation of resilient urban areas; however, this is not an easy task and raises several new questions. Is it possible to change the value systems imposed under the market-dominated approaches and introduce new value systems that are more sensitive to the future needs of society? Is there a possibility to define new planning ethics that will be based upon the concept of resilient urban areas?

Finally, how can resilience thinking be brought to the level of each individual and community, thus increasing awareness as part of the resilience strategy so that

it does not become just another fashionable policy term that appears in every policy document without real meaning for practice? The authors believe that the first step is to increase awareness among the social scientists and planning scholars who think, write and carry out research to come up with convincing arguments for urban policymakers about the urgent need to change the way we understand just what planning is all about and how it should be practised. This book intends to contribute to the initial steps towards increasing the awareness of planners and thus changing the way we think.

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