

Introduction

Resilience, Climate Change and Adaptation – the resilient city as new paradigm in urban planning?

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Challenges of resilience in European cities

In Germany and other European countries, the sustainable development of cities and regions is steadily discussed in relation to the concept of resilience (BIRK-MANN et al. 2013), especially with regard to the ongoing global climate change. Impacts on human and natural systems resulting from the worldwide climate change are less and less neglectable (IPCC 2014, 2-4). To reduce the vulnerability of biological systems, to protect communities and to strengthen the resilience of the economy, adaptation strategies were developed and set in place on several spatial levels (e.g. from a European perspective to regional approaches to urban adaptation strategies). The focus of adaptation strategies is on more planned and proactive means of adaptation, dealing with a reduction of vulnerability of ecological-social-economic systems to the impact of climate change (SMIT et al. 1999, 200-202). Of course, this adaptive perspective on cities and regions is also crucial for other policy fields, as the germinal question for cities is to what extent and by which strategies they can increase their resistance successfully – with regard to the ecological capacities of cities, to the backdrop of the financial scarcity of public budgets, to high refugee numbers searching for shelter in cities and so on.

The development of „crisis-proof cities“ is thus a key factor for an overall sustainable development (JAKUBOWSKI 2013). In the events of crises such as financial crises as well as refugee influx or hazards like floods or climate related heat waves and droughts, cities should be able to fulfil their societal and economic duties in the long term. In this context and according to the ecological buffering capacity, resilience is understood as the ability of a system to maintain central functions (robustness) even under the influence of external shocks and disturbances (HOLLING 1973, 1996). On the other hand, resilience includes the ability to restore the system after the effects of disturbances and shocks, and the further development of lear-

ning and reorganization processes (BIRKMANN et al. 2013, p. 18, LEI et al 2014,p. 619; LIAO 2013; DIELEMAN 2013, p.176). Resilience thus encompasses the ability of a system to react to crises and disturbances, a dynamic balance of self-renewal and design possibilities (self-regulation). In a transformation process, existing structures are transformed into resistant and forward-looking forms (see figure 1). This is the basis for a sustainability-oriented development in a city-regional system in which resilience structures are developed and strengthened in planned, self-designed and natural processes (BREUSTE et al. 2016, p. 180; VALE and CAMPANELLA 2005, WALKER et al. 2006). A resilient urban system thus combines different characteristics, such as self-sufficiency and exchange, redundancy and diversity, stability and flexibility, compactness and de-centrality, and the ability to learn and adapt (BREUSTE et al. 2016, p. 2).

This becomes even more important as preventive measures are often related to long-term investments which compete with current problems and limited resources. As consequence, preventive solutions are often not implemented, meaning that chances for the resilient development of cities are missed somehow, including the risk that comparable measures will be significantly more time-intensive or expensive at a later stage (NEUE STIFTUNG VERANTWORTUNG 2013, p. 13).

System State Transition in Resilience

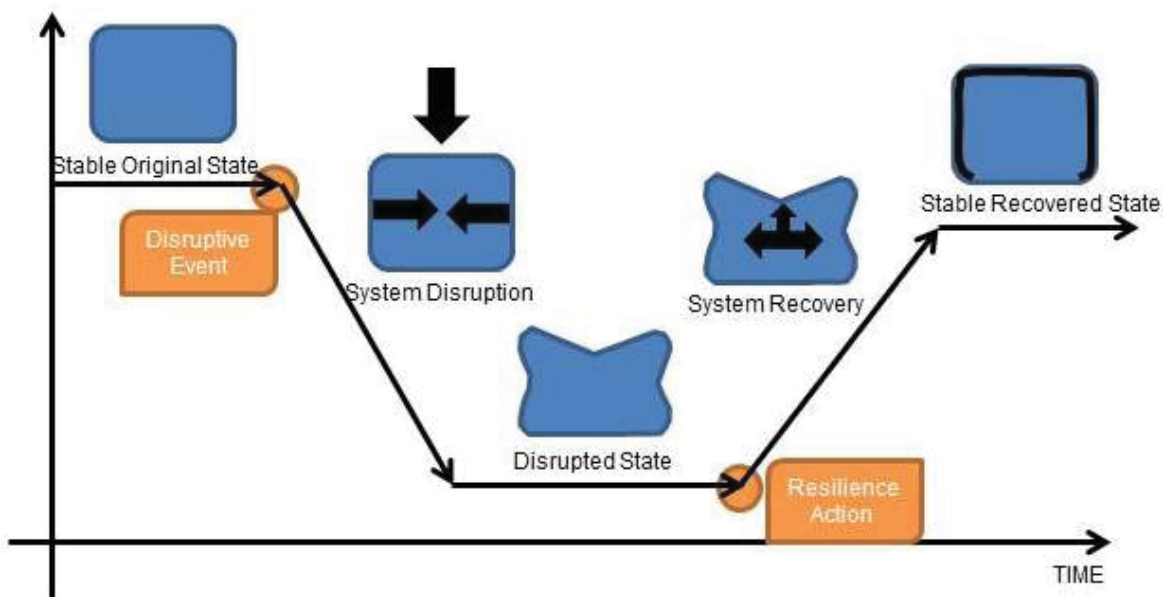


Figure 1: System State in Transition (own figure, adopted and slightly changed from HENRY and RAMIREZ-MARQUEZ 2012, p. 117)

According to CHRISTMANN et al. (2016), the debate around resilient cities can, among others, be classified along the following dimensions (see figure 2; see also www.100resilientcities.org):

Analytical dimensions of urban resilience

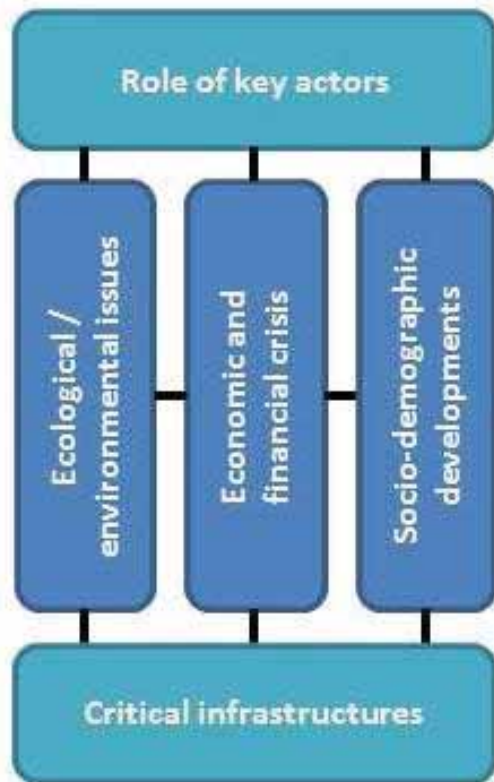


Figure 2: Dimensions of the debate about resilient cities (according to CHRISTMANN et al 2016)

Ecological or environmental issues: It is particularly the intensive debate about climate change and disaster management that considers urban development under the lens of (ecological) resilience (e.g. BIRKMANN et al. 2013; see also www.100resilientcities.org). BIRKMANN (2008), for example, looks at the vulnerability of society and that of different land uses. GREIVING and FLEISCHHAUER (2009, p. 18) see resilience and a ‘resilient society’ as an

overall vision and guiding principle for future urban development in Germany that is related to the necessary adaptation to climate change. OSTROM (2009) constructed the research framework for promoting the sustainable development of social-ecological system through stimulating self-organization. CONTAMIN et al. (2009) pointed out that the management decision and taking warning signal are very important to avoid the regime shift of the urban ecosystem. More recently, resilience also covers the consideration of urban ecological systems as basis for urban development (BREUSTE et al. 2016).

Economic and financial crises: The economic and financial crisis has hit many European countries and cities (HADJIMICHALIS 2011; WERNER 2013). Many studies (e.g. KNIELING and OTHENGRAFEN 2016) analyse, in a European context, how cities and urban regions and their citizens deal with the consequences of the recent financial and socio-economic crisis,

including effects for political local regimes, cuts in local public spending and the processes of privatization of local public assets, as well as issues related to the rescaling, recentralization, or decentralization of competencies. Attention is paid to the rise of new 'austerity regimes', the question of their legitimacy, and their spatial manifestations, and in particular to the social consequences of austerity. In the European context, the concept of resilience is furthermore used to analyse to what extent cities and regions can adapt (or not) to structural economic changes (GRABOW and SCHNEIDER 2013; PLÖGER and LANG 2013).

Socio-demographic developments: Many European countries face strong trends towards an aging population, population decline, and dependence upon immigration for population growth (PALLAGST et al. 2014). The demographic change will particularly have impacts on economic growth, the labor and capital market, housing, fiscal policy, pensions, and health care (e.g. HAMM et al. 2008). In this context, the concepts of decline and resilience are discussed with regard to their explanatory value for understanding urban and regional change in times of crisis (LANG 2016).

Critical Infrastructures: As our cities are highly dependent on technical infrastructures that are supplying the urban society with all kind of services (water, electricity, information- and communication technologies etc.) there are also studies dealing with the role of these critical infrastructures (CHRISTMANN et al. 2016). Critical infrastructures are infrastructures that, in case of a damage or breakdown, will cause long-term supply shortages, disturbances of the public safety or other consequences. It is the aim of these studies to identify the vulnerability of critical infrastructures and to develop strategies to become more resilient, based on collaboration of different actors, preparedness and flexibility (AMIN 2000,p. 47-50; BOIN and MCCONNELL 2007, p. 37; p.108; CHRISTMANN et al. 2011, p. 36-40;)

Leadership and the role of key actors in and for resilient cities: To implement certain policies or strategies to enhance the resilience of cities and city-regions, the key actors and their interests have to be considered (www.100resilientcities.org). ANDERSON (2014) compared the results of civic leadership and expert leadership in urban green space management and puts

forward relevant enlightenment. As the development of resilient cities is subject of urban development policies it can be considered that the actors are the same as in urban development processes, including politicians, planners, economic and civic actors (CHRISTMANN et al. 2016; SELLE 2013). In this context, it is discussed how cities or regions can become more resilient through fostering collaboration between the various actor groups and establishing local networks to increase the 'governance of preparedness' (MEDD and MARVIN 2005; see also 222.100resilientcities.org). Therefore, the cooperation between public and civic actors is crucial (FELLMER 2014). REDDY (2000) pointed out factors such as community leadership, stakeholder involvement, and local strategies and policies are important factors in the long post-disaster recovery process. OLWIG (2012) discusses the construction of cooperation mechanism between local government and international organizations in the process of disaster reduction and relief; additionally, the 'governance of preparedness' and the ability to take actions with regard to resilient cities is also dependent on the willingness and problem solving capacities of politicians (e.g. OTHENGRAFEN 2014).

All different fields have in common that they use resilience to describe the relationship between the system under observation and externally induced disruption, stress, disturbance, or crisis. It is, however, more than a response to particular challenges – resilience is understood as a kind of systemic property (LANG 2011, p. 16) including, inter alia, risk and vulnerability assessment of a system as well as assessing and enhancing the adaptive capacity of the system. Assessing the vulnerability of cities, for example, can encompass issues such as climate change (vulnerability to sea rise level, urban heat islands etc.), environmental capacity (e.g. pollution, land use, consumption of natural resources), infrastructure (energy and water infrastructure, access to basic utilities, etc.) or access to housing, education, and health care (ILMOLA 2017, 218-221). Enhancing the adaptive capacity of cities can consist of governance arrangements (e.g. community participation to decision-making, leadership to look at long term issues), institutions (the capacity of delivering public services by public bodies and community groups, etc.) and local planning systems (disaster planning and rehearsals, proactive thinking and acting, planning strategies, etc.).

However, an integrated spatial approach towards urban resilience or resilient cities is still lacking (BIRKMANN 2008; CHRISTMANN et al. 2011 and 2016) so that the research project “HeKriS – Challenges of resilience in European cities“ (resilient-cities.eu), with its focus on theoretical considerations and reflections of urban resilience, can contribute to the development of theoretical (spatial) approaches and innovative solutions concerning resilient cities. The aim of this research project as well as this publication is to identify practical experiences and strategies with regard to urban crises or challenges in German and Greek cities and to develop resilient strategies and measures for implementation and to check them for their applicability to other contexts (policy transfer).

The resilient city – contributions to a broader understanding of this concept/ challenge

All five contributions aim to give the quite abstract term of resilience a more specific understanding in the specific contexts. The overall topic which can be found in all contributions is the ability to resist negative impacts of a changing environment.

The first contribution „**Lessons from local resilience planning in European cities – The case of the Smart Mature Resilience project**“ from *Vasileios Latinos* introduces the Horizon2020 project ‘Smart Mature Resilience’ which is developing standardized approaches and tools to support the development of climate adaptation and resilience strategies. The chapter presents the most important lessons learnt from the pilot implementation process in the three cities.

“**Presuming a nature in the context of resilience**” focuses on the conceptualization of nature and the delimitation of our relationship with it. *Antonis Chazapis* and *Dimitris Loukos* bring the working hypothesis that recent transformations and the reorganization of institutional and social structures and political associations on a global scale, adopt and respond to the possibility of destruction as a result of unpredictable „natural“ or „moral“ evil into focus and deal with the climate change as a central subject of a contemporary discourse that concerns our stasis towards the environment.

Kalliopi Sapountzaki describes social risk (re)activation processes and vulnerability trajectories in the Greek cities in the economic crisis era and how they are influenced by institutional, collective and individualized resilience in “**Understanding good and bad resilience: the case of Greek cities in the economic crisis era**”. Furthermore she offers a planning perspective for what she termed as “Good Urban Resilience”.

The fourth contribution „**Aspects of resilience in the reconstruction of Kalamata (Greece) after the earthquake disaster of 1986**“ from *Miranda Dandoulaki* discusses the case the reconstruction of Kalamata city, Greece, after the 1986 earthquake disaster, focusing on urban resilience during the phases of response, recovery and reconstruction. A set of factors such as political and economic strategies or comprehensive urban plans are identified and features of resilience are detected.

In „**Tackling Climate Change and Urban Resilience in the City of Athens**“ *Anthi Christou* and *Eleni Myrivili* present the Athens' resilience framework and explain the partnerships and collaborations with international city networks, such as 100 Resilient Cities and C40 Cities Climate Leadership Group. The Athens Resilience Strategy for 2030 and implementation of it are described.

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