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Viewpoint

Building up resilience in cities worldwide – Rotterdam as participant in the 100 Resilient Cities Programme[☆]

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ABSTRACT

Cities worldwide are challenged by a high complexity of acute and chronic problems, including challenges related to economic development, social polarisation and segregation as well as climate change and ecological degradation. While all of these problems are complex in themselves, they are also interrelated. Addressing them in a meaningful way requires governance systems with systemic capacities to deal with complexity. In order to create resilience in urban systems, cities need to be able to learn, adapt and transform across sectors and levels. One definition of urban resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow regardless of the kinds of chronic stress and acute shocks they experience. This is the definition the Rockefeller Foundation adopts in its mission to promote the well-being of humanity throughout the world by facilitating the building of resilience in cities worldwide through its 100 Resilient Cities Programme, launched in 2013. Rotterdam is one of the first cities to participate in this programme. The city has been a front-runner in preparing for climate change and striving for urban sustainability. This paper assesses the concept of urban resilience, introduces the Rockefeller Foundation's effort in building city resilience worldwide and illustrates this with the Rotterdam case.

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1. Introduction

Across the world, cities are challenged by acute and chronic problems. Acute problems include shocks such as earthquakes, floods, and disease outbreaks. Chronic problems are stresses that weaken the fabric of a city on a daily or cyclical basis. Examples include high unemployment, inefficient public transportation systems, unbalanced composition of the population, chronic food and water shortages, and endemic violence. Challenges may be related to economic development (Healey, 2007; MacLeod & Goodwin, 1999), social polarisation, and segregation (Wacquant, 2008; Dikec, 2007) as well as to climate change and ecological degradation (Wheeler, 2013; Mol et al., 2009). While all of these problems are complex in themselves, they are also interrelated. Policies and actions in response to economic challenges, for example, may very well affect, both negatively and positively, social and

ecological aspects of the city and vice versa, adding to the unpredictability and complexity of possible solutions. In order to steer development towards economic, social, and environmental improvement, governance systems must build systemic capacities to deal with complexity. They need to be able to learn, adapt and transform across sectors and levels and to create resilience in the urban system (Hassink, 2010; Pendall et al., 2010).

Resilience finds its roots in applied sciences, where the term is used to describe the stability of materials and their resistance to external shocks (Davoudi, 2012: 300; Lu & Stead, 2013). In the 1960s it entered the field of ecology, where resilience is defined as “the magnitude of the disturbance that can be absorbed before the system changes its structure” (Holling, 1996: 33). Davoudi (2012: 300–301) explains that in this view “resilience is defined not just according to how long it takes for the system to bounce back after a shock, but also how much disturbance it can take and remain within critical thresholds. (...) What underpins both perspectives is the belief in the existence of equilibrium in systems, be it a pre-existing one to which a resilient system bounces back (engineering) or a new one to which it bounces forth (ecological).” Resilience as a notion in relation to cities and planning surfaced in the 1990s, in response to the environmental threats of adjusting social and institutional frameworks (Mileti, 1999 in: Lu & Stead, 2013: 200). The challenge of climate change required a new approach in the urban context. Planners and decision-makers gradually

[☆] The authors were part of the formal monitoring team hired by the Rockefeller Foundation. This paper only reviews public documents and discusses general observations from the monitoring process.

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realised that mitigation alone was difficult to achieve and therefore favoured the more adaptive and flexible approaches of resilient strategies in decision-making (Lu & Stead, 2013; Tasan-Kok et al., 2013). The way in which urban resilience is applied in planning differs among planning cultures. Coaffee (2013) concludes that Anglo-Saxon countries differ from the European mainland in their interpretations of urban resilience. In countries such as the US and the UK the original focus was on shocks as a result of the 9/11 terrorist attacks, whereas the European mainland was more focused on climate change.

As part of its mission to promote the well-being of humanity around the world, in 2013 the Rockefeller Foundation adopted a new programme focussing on urban resilience. The 100 Resilient Cities (100RC) Programme is dedicated to helping cities around the world become more resilient to the physical, social, and economic challenges that increasingly affect the 21st century. In the view of 100RC, resilience includes not only the shocks (such as earthquakes, fires, and floods), but also the stresses that weaken the fabric of a city on a day-to-day or cyclical basis. By addressing both the shocks and the stresses, a city becomes more able to respond to adverse events, and is overall better equipped to deliver basic functions in both good times and bad, to all populations. Rotterdam (the Netherlands) was one of the first cities to participate in this programme and has been a front-runner in preparing for climate change and striving for urban sustainability. This paper introduces the City Resilience Framework, which was developed for the 100 Resilient Cities Programme to underpin its strategy towards participating cities. Section 3 then briefly introduces the tools and instruments offered by the 100 Resilient Cities Programme. Rotterdam is used as an example of the resilience approach. The fourth section explores whether, and how, the thinking on resilience has shifted within the city of Rotterdam as a result of participation in the 100RC programme. The paper concludes with some considerations towards the City Resilience Framework as a source of inspiration for cities worldwide.

2. Resilience within the 100 Resilient Cities Programme

2.1. The Rockefeller's City Resilience Framework

In order to be workable and relevant for cities, the Rockefeller Foundation adopted the following definition of urban resilience:

Resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.

This definition and the accompanying resilience indicator framework were developed by ARUP's International Development team (2014) in a commissioned and coordinated study by the Rockefeller Foundation. The Rockefeller Foundation committed itself to the resilience theme in 2007, when it announced its first multi-million dollar contribution to the "Building Climate Change Resilience Initiative". This programme aimed to boost communities' resilience to the effects of climate change with a focus on poor and vulnerable people across the globe. Since then, Rockefeller has gradually developed its understanding of resilience while widening its scope both geographically and thematically from a focus on poor and vulnerable regions to western cities in advanced economies as well, and from climate change alone to a broader perspective on disaster risk reduction, including financial shocks, terrorism, and slow moving chronic stresses (ARUP, 2014). These are themes that are (also) part of the 100RC Programme.

In so doing, one of the main challenges Rockefeller observed was the development of a framework that enables cities to understand, analyse, and assess their own resilience. In the words of the Rockefeller Foundation's managing director Nancy Kete, the local "(...) perspectives found were siloed, shaped by experience and expertise in one or another aspect of resilience, disaster risk reduction, infrastructure resilience, climate change, national security or business continuity" (ARUP 2014: 1). Resilience thus is regarded as an integrative challenge by Rockefeller

and building resilience is understood as an interdisciplinary, cross-initiative objective (Martin-Breen & Anderies, 2011). Consequently the aim of ARUP's resilience framework is to present, on the basis of literature review, case studies, and fieldwork, a holistic integrative set of categories, indicators, and variables. In their own words, "the purpose of the City Resilience Index is to provide cities with a robust, holistic, and accessible basis for assessment so that they are better placed to make investment decisions and engage in urban planning practices that ensure people living in cities, particularly the poor and vulnerable, survive and thrive no matter what shocks and stresses they encounter" (ARUP, 2014: 21).

On the basis of a literature analysis and fieldwork based on interviews, workshops, and focus groups in a number of cities, the City Resilience Framework was put together as an analytical tool. The City Resilience Framework as presented in Fig. 1 distinguishes between four categories (outer ring), twelve indicators (second ring), and seven qualities (inner ring) (ARUP, 2014). The framework is elaborated in Fig. 2. The four categories are considered basic elements available to a greater or lesser extent in all local systems. They cover (1) the health and wellbeing of individuals (people); infrastructure & environment (place); economy and society (organisation); and, finally, leadership and strategy (knowledge). The twelve indicators have been found to be critical in cities dealing with shocks and stresses and describe the fundamental attributes of a resilient city. They are performance indicators and describe the outcome of actions to build resilience, not the actions themselves (ARUP, 2014: 8). Finally, the extent to which the seven qualities are available provides an indication of how well cities are able to respond to changing situations. See Table 1 for an elaboration of these qualities. It is beyond the scope of this paper to elaborate on each of these categories, indicators, and qualities.

What is important is that resilience is considered a much broader challenge than, for example, disaster risk reduction and the related hazards with which it is often connected. Instead, in the words of ARUP "[resilience] accepts the possibility that a wide range of disruptive events – both stresses and shocks – may occur but are not necessarily predictable. Resilience focuses on enhancing the performance of a system in the face of multiple hazards, rather than preventing or mitigating the loss of assets due to specific events" (ARUP, 2014: 3). In so doing, the Rockefeller's resilience perspective can be considered an attempt to bridge the gap between abstract theoretical notions of resilience and a

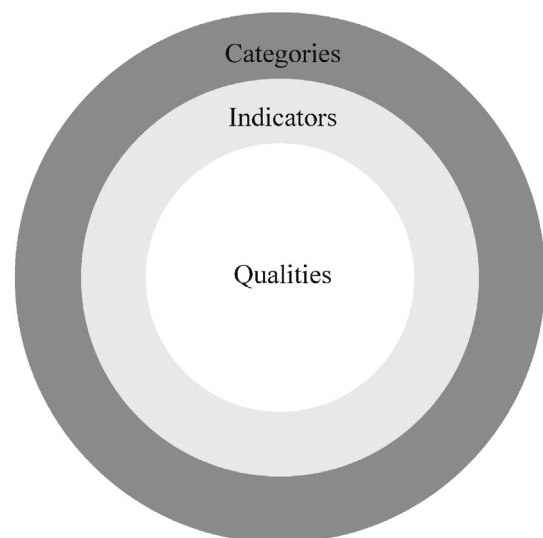


Fig. 1. The structure of the City Resilience Framework as developed by ARUP. Source: ARUP, 2014: 8.

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