Resilient City: Opportunities for Cooperation

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It is the first time in history that more people are living in cities than in rural areas. As urban space has become the central aspect of modern societies creating new types of vulnerabilities, resilience has emerged as a key priority for urban planners as well as civil protection officers aiming to build smart and disaster resilient cities. There is a large set of urban planning practices aimed at increasing urban disaster resilience; however, there is still a lack of endeavor to research how such processes are being incorporated into national civil protection systems. Therefore, this article aims to bridge the gap and analyze the relationship between urban planning and civil protection in conceptualizing resilient and smart city development processes. In this paper, using a case study approach, we examine if and how the Danish Emergency Management Agency (DEMA) integrates urban planning and civil protection in Denmark in order to build more resilient cities. To do this, we draw upon the knowledge of those working within the urban planning and civil protection system, to identify the opportunities and obstacles for the existence of the cooperation. Copenhagen, ranked the world's most climate resilient city, was selected for the urban planning case analysis.

Introduction

Nowadays, the world's population is urbanizing more rapidly than at any time in human history. Growing populations and increased density make cities vulnerable to disruptions, crises, and disasters. The fast expansion of cities resulted in building infrastructures in hazard prone areas, developing urban areas that have highly negative impact on ecosystems, burdening social and economic systems. According to the World Bank's estimate, in the period between 1980 and 2012, nearly $4 trillion has gone into relief and recovery efforts worldwide for natural disasters alone [1]. There is an increasing evidence on how investment in resilience can reduce the amount of money spent on recovery and relief through avoided losses [2]. Therefore, there is no question that building resilience in modern cities should be a priority on both national and international political agendas.

In 2011, Copenhagen was declared the world's most climate resilient city [3]. Nevertheless, in early July 2011, in less than three hours, a heavy thunderstorm flooded streets and key roads of Copenhagen causing damages for $1,04 billion [4]. In September 2014, once again large parts of the city were flooded by heavy rain causing chaos and shut down of train service [5]. Built on the assumption that in order to build urban resilience there is a need for a holistic approach and involvement of different actors, this paper aims to explore cooperation between civil protection and urban planning systems.

1. Resilience and a City

Nowadays resilience is one of the most popular and at the same time most contested disciplines in hazard research. It could be argued that there are two major directions in the way how a resilient system should respond to a shock emerged, namely engineering and ecological resilience. When applied in mechanics, engineering, mathematics, and similar disciplines, resilience is focused on system's behaviour near a stable equilibrium and the rate at which a system returns to steady state following some disturbance (bounce back) [8]. On the other hand, ecological resilience is an adaptive process characterised by systemic re-organisation, renewal, flexibility and development. More than equilibrium is possible (adaptation) [9].

In the urban context, resilience approach is targeted towards making cities more able to respond to shocks and improve the overall delivery of basic functions and services on a daily basis as well as in

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times of a crisis. Meerow et al. identified 25 definitions of urban resilience in the up-to-date literature, which shows how contested and ambiguous the concept itself is [10]. The concept of urban resilience was traditionally used to denote persistence of a city and therefore was positioned within a single equilibrium resilience perspective [11] [12]. For example, Godschalk suggests that resilient city is "[…] capable of withstanding severe shock without [suffering] either immediate chaos or permanent harm" [13].Yet, in recent years different authors began to emphasize the adaptive component of the concept arguing for a dynamic concept of urban resilience and the ability of a city to adapt to the constantly changing environment [14][15][16].

Asian Cities Climate Change Resilience Network (ACCCRN) argues that resilient cities are able to withstand a variety of challenges because of the redundancy, flexibility, capacity to reorganize, and capacity to learn being integrated into the urban systems (see Figure 1) [17].

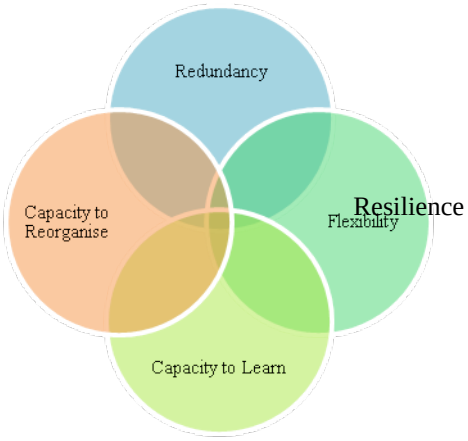

Figure 1: The elements of urban resilience.

Acknowledging the complex nature of an urban space, it is argued that different components within a city require different resilience approaches. Bouncing back and persistence might be desirable qualities for such urban components as electricity poles; while it is desirable for communities living within a city to positively adapt to urban disasters. Building resilient city requires a holistic, flexible, and multi-sectoral approach to urban development.

2. Designing Resilient City: Actors Involved

It should be noted that it is beyond the scope of the current article to discuss all the actors involved in the process of conceptualising resilient city development process, therefore, we will concentrate on the involvement and collaboration of civil protection agencies and urban planners.

In the wake of the resilience hype, calls for adoption of resilience approach to civil protection were placed as the top priority at the national and international level of disaster risk management policies. Civil protection organisations were one of the primary governmental actors entitled the role of helping in the process of building community resilience in different countries. They are the institutions primarily responsible for preparing national strategies for resilience and disaster risk management, including resilience of cities as constituent part of every country. In order to achieve an overall disaster resilience of a system (a country in this case), one needs coordinated actions where resilience of separate parts of the system comprises and complies with the resilience of the system itself.

Urban planning is concerned with the use of land, design of the urban environment, protection and use of environment, planning of infrastructure systems such as transportation and communication, etc. The resilience approach in urban planning assumes that the future cannot be predicted and will

include unexpected shocks, and that urban systems must be designed and oriented in ways that serve sudden and unanticipated changes.

3. Methodology

As the current research aims to explore area that is highly under-theorised, the method of case study analysis was chosen as it focuses on a small number of cases that are expected to prove insight into a causal relationship across a larger population of cases [6]. As a case study, we chose Copenhagen entitled as the world's most climate resilient city.

As not all the data can be found in the official state documents and secondary literature, we used semi-structured interviews to retrieve invaluable information from urban planners and designers as well as different actors working within civil protection and emergency management agencies in Denmark. The method of semi-structured interviews consisted in having a set of questions to be covered but also allowing interviewees a great leeway in how to reply to them [7]. We formed three questionnaires for each of the target group: civil protection agencies, urban planners, and researchers. In the Copenhagen region, we had phone interview with a representative of the urban area office (Områdefornyelse), a representative of the SLA urban planners company, and a representative from the DEMA. In order to respect the confidentiality of the interviewees, we will not mention their names.

We also conducted an additional Skype interview with Dr. Alan March, Associate Professor in Urban Planning at the University of Melbourne, to gather knowledge on the application of urban resilience in Australia, which is one of the leading countries in the field of resilience.

4. Results

The results of our interviews confirmed our initial assumption that there is no cooperation between the DEMA and urban planners in conceptualising resilient city development processes. Although all interviewees agreed that there is a need for a holistic approach to urban resilience, in Denmark, national civil protection and urban planning systems operate in different systemic dimensions without any close interaction. In Copenhagen, urban planning processes are initiated at the municipality level. However, the municipality does not have any clear strategy for building resilience. The urban area office (Områdefornyelse) is the entity responsible for initiating resilience related projects and applying to the responsible ministry for funding. Nevertheless, the office does not coordinate their project ideas with the DEMA in any way.

In a personal interview with SLA urban planners, who implemented one of the projects aimed at building urban resilience, they informed us that there was no consulting with DEMA regarding the project. However, some of the local level civil protection agencies were involved in the process at a certain degree. While developing the project, urban planners worked in collaboration with Copenhagen fire brigade and police.

During the interview with DEMA, we found out that their primary focus is on fire prevention and not on building resilience so to say. This can be explained by the lack of resources and competences they are experiencing at the moment. As a state agency, they are in a middle of extremely important budget cuts which forces them to make difficult decisions and prioritize. We also learned that even though they have been involved in the national strategy work done under the Hyogo framework, they still have not been tasked with doing the same under the Sendai framework. They do not see themselves as the being the right agency to be responsible for the development of a national resilience strategy or monitor urban resilience building efforts.

5. Conclusions

Interview with Dr. Alan March helped us to draw some possible future directions for urban resilience in Denmark. First, DEMA needs sufficient financial and human resources directed at implementing urban resilience. Second, there needs to be political will to establish itself as a central coordinating actor in the process of building urban resilience. Third, urban planning system that requires referrals between different agencies needs to be established. Alan March explained that after the Black Saturday fires in Australia in 2009, the Minister for Planning of the Victoria state initiated establishment of urban planning system that requires referrals between emergency, fire, police services and urban planners. “All of them were directly involved in the preparations of the planning system, and in the background of it an extensive hazard mapping process occurred assessing the risk profiles across the entire state. This was used as the beginning of a more detailed town planning and design process that assessed each community.”

Finally, acknowledging the need for a holistic approach to urban resilience, a specialised education needed for the expertise in the field should be established. “When talking about hazards one needs to understand the whole complexity of things. For example, in the case of a bushfire one needs to understand how forest works, how forest fire works, how the interaction between fire and a settlement works, one also needs to understand buildings and human behaviour in emergency situations.” In 2009, there were only a few people in the whole state who had this skills set. Therefore, Australia went one step further and introduced an education covering primary school level up to the university higher degree and aiming at increasing knowledge in hazard management. According to Alan March, one part of it was the development of a post-graduate training to enable people to become experts in the area. “We developed bushfire and design qualification intended for urban planners, architects, engineers, landscape architects, forestry and ecology educated qualified people who could undertake bushfire assessment in the higher degree quality. These people can understand the whole picture from the forest to the designed structure and are capable of independently providing full bushfire risk assessment. This is almost a new profession.”

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