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# THE STRENGTH OF RESILIENT CITIES AND THEIR CHALLENGES

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***Abstract:*** *The city is a complex and dynamic system which is constantly growing and evolving. A large number of dangers with catastrophic consequences that have befallen cities around the world, significantly disrupt this development. At the same time, they contribute to a modern approach to resilience planning and have become a priority for city administrations, planners, managers, architects, designers, sociologists, environmentalists and international organizations advocating for a new resilience agenda. Anticipating and planning the resilience of cities is a demanding process and involves assessing the vulnerable components of cities, understanding the key processes, procedures and interactions that affect these components. Urbanization and growing megacities point to the need for more resilient cities that have the capacity to withstand shocks to population growth, global economic crises, rapid population demographic changes, and environmental disasters. In such circumstances, cities must dedicate themselves not only to efforts to develop their own resilience capacities, but also to cooperation with neighboring cities, countries and regions in facing new challenges.*

***Key words:*** *city, disasters, vulnerability, resilience*

## 1. INTRODUCTION

Cities are often described as complex and dynamic systems that represent a specific mixture of different peoples, with different cultures, social norms of behaviour and lifestyle as well as various significant social functions. Because of all this, modern cities represent "globalization destinations" that have outgrown local boundaries, have new strength and require a completely new approach to development and protection. Favourable economic, social and infrastructural elements have fuelled the growth of the urban population, from less than 1 billion in 1950 to a predicted number of approximately 8 billion in 2050. People are moving to cities in greater numbers than at any given moment throughout history, driven by the hope of better opportunities or pushed out of rural areas by poverty, environmental degradation, conflict or natural disasters. Rapid urbanization has brought apparent prosperity and opportunities to many people. On the other hand, cities face numerous challenges and problems - the increase in population increases the pressure on the existing capacities in those cities and causes problems such as unemployment, social exclusion, poverty, inability to ensure affordable housing. Moreover, cities are generators of new risks: urban degradation of the environment,

increasingly specific microclimate, the spread of illegal construction, failed critical infrastructure, and more recently, the concentration of a large number of forced migrants. In addition, a large number of risks with catastrophic consequences that have befallen cities around the world, present new challenges, significantly disrupt this development and contribute to its unsustainability and reduced resilience.

Anticipating and planning the resilience of cities is a demanding process and involves assessing the vulnerable components of cities, understanding the key processes, procedures and interactions that affect these components. Sustainable and resilient cities have become a priority of city administrations, planners, managers, architects, designers, sociologists, ecologists, as well as international organizations that advocate for a new resilience agenda.

## 2. FACE AND STRENGTH OF THE CITY

The city in its full meaning implies a geographical hub, an economic organization, an institutional process, as well as a field for social action. According to Mumford (2010), the city is a related collection of primary groups and purposive associations: the first, like family and neighbourhood, are common to all communities, while the second are especially characteristic of city life. These diverse groups are self-sustaining through economic organizations that are similarly more or less corporate in nature, or at least publicly regulated, and all of them are housed in permanent structures, in relatively limited space. Zlatar (2013) in the analysis of urban transformations of the modern city quotes the thoughts of K.Lynch. In the book "The Image of the City", this author explains how the concrete elements of the city, i.e. people with their activities, are just as important as its physical parts, and how they constantly influence the city space through their actions. Also, the growth of a city, as well as its shape, can never be fully controlled. This means that change is its natural state that needs to be accepted, and, even more, the planned process of change is at the same time an autonomous process (Zlatar 2013,10 according to Lynch 1960).

Significant changes in modern cities are recorded and announced by databases of international organizations. These data show that in the second half of the twentieth century, a significant economic transformation was accompanied by a rapid growth of the urban population and an increase in the level of urbanization. According to the reports of the United Nations (UN-ESA, 1999) at the end of the 20th century, there is a significant shift in the share of non-urban (rural) population, urban population and population of megacities. Between 1950 and 2000, the share of the world's rural population fell from 70% to 53%, and in more developed regions of the world, even to 24% (Stiperski; Fuerst Bjelis 2003,1054). The urban population is expected to continue to grow, so that in 2050 one third will be rural (34%) and two thirds urban (66%) (World Urbanization Prospects, 2014). Most existing cities became overpopulated because they had real advantages of international communication; they are places where transcontinental and transatlantic routes meet, they often possess a superior legacy of cultural institutions that reach far into a unique historical past.

Today, in addition to the rapid increase in population, cities around the world are beginning to merge, creating integrated settlements that have been called "mega-cities", "mega-regions" or "endless cities". They can stretch for hundreds of kilometres and be home to over 100 million people, according to the United Nations report - "*State of the World's Cities" 2008/2009 - Harmonious Cities, UN Habitat agency*. It is estimated that by 2030 there will be 41 "megacity" with over 10 million inhabitants (https://esa.un.org). There are predictions that the population in such environments will consume about 81% of the world's resources (https://www.mckinsey.com). The Intergovernmental Panel on Climate Change (IPCC) report indicates that cities consume up to 70% of the world's energy and generate about 80% of global carbon dioxide emissions (Climate Change 2014).

Analyzing the most important economic characteristics of the modern city, Majetic (2014) cites the thoughts of Florida and Gertler (2003) that the city represents a place of optimal development of "new industry" companies. He also cites the claims of Sassen (2001; 2006), which explains how smaller, highly profitable and highly specialized service companies "grow" in more developed cities. According to Graham and Marvin (2000, 78) "the small creative companies that dominate Internet software development, digital design and WWW services... are concentrated in a small number of metropolises", and according to O'Connor (2004, 2) a significant majority of companies from the cultural industry sector is located in the city centres and, as it seems now, will remain there.

It is evident that the city is becoming a "synthesis of everything that is progressive, i.e. the city produces innovations, knowledge, trade, an increase in living standards, a rich and complex social and cultural environment" but it also produces "urban problems such as population segregation, urban poverty and crime" (Simunovic 2007,18). For these reasons, the models and concepts of a sustainable city, a responsible city, a livable city, and a participatory city are increasingly discussed[1].

In the last few decades, an additional threat is posed by natural hazards. They affect cities in different ways, but the potential for disaster is constantly present as city governments face overpopulation, rapid urbanization, and environmental degradation. For example, earthquakes affect cities because many densely built and populated cities lie on seismic activity belts. Poorly designed and poorly constructed or poorly maintained buildings cannot withstand the force of seismic shocks, so collapse is more likely. Most of the deaths due to the earthquake occurred due to the collapse of buildings. The growing number of poorly constructed or improvised homes built on or under steep slopes, on cliffs or at river mouths, in mountain valleys, combined with poor drainage or slope protection, results in more people being exposed to catastrophic landslides. Many cities are built along coastlines that are often hit by tsunamis. Adequate construction, early warning, notification and alarm system and evacuation plans represent the primary measures to solve this problem. Urban areas are exposed to cyclones, strong winds and heavy rains. The primary measures are wind-resistant construction, an early warning system with advice for households to close windows and protect property, and if necessary, evacuation. Overflowing of major rivers and flash floods are the most common and most dangerous risks in most cities around the world, with statistics showing that over 40% of all natural disasters involve floods. Floods are a growing danger for cities because forests as connective tissue are overexploited and destroyed, concrete and compacted soil do not absorb water, open spaces are populated, river flows are diverted due to construction, and also city drainage systems are inadequate. Drought is also a growing natural disaster hazard, slowly emerging and causing migration to urban areas, putting additional pressure on housing policy, employment and basic services.

[1]The sustainable city model, apart from its strictly physical boundaries, also reflects the social matrix of the city. It manifests itself through countless different forms, depending on the historical heritage, culture, economic base, climate, geographical and geopolitical characteristics, so that all these forms can ultimately be reduced to just a few variables that determine it. Sustainability, first of all, should be reflected in human intentions as part of any city development strategy. The term responsible city refers to responsibility in the management of flows within and outside the city. The basic issue of responsibility boils down to the fact that problems in functioning are transferred to the future or to other locations. The vision of a livable city focuses on the built environment and its management, as well as creating a healthy environment. Participatory city implies the harmonization of different interests of the business sector, environmental protection and community development requires the creation of partnership (Milutinovic 2004).

The aforementioned characteristics of natural hazards point to the fact that regardless of how well prepared a country is and how solid its policy frameworks are, it will often face disasters with inevitable and highly devastating consequences, especially in megacities. If recovery processes are only partially implemented and are not aimed at strengthening resilience, the consequences of disasters can last for a very long time and affect the lives of entire generations.

## 3. CITY CHALLENGES IN APPROACHING AND BUILDING DISASTER RESILIENCE

Resilience in terms of cities mainly refers to the ability to absorb, adapt and respond to changes in the urban system. However, resilience shares much with other key contemporary urban goals such as sustainability, governance and economic development (Tompkins and Hurlston, 2012). The concept of resilience has only recently attracted more attention at the global level, primarily due to the increase in the risk of natural disasters in general, and in particular the risks associated with climate change. Spreading the concept of resilience as a way of thinking in interdisciplinary scientific approaches highlights the property of resilience as "the ability of human communities to withstand external shocks to their social infrastructure and to recover from such disruptions" (Adger 2000). Shocks and pressures refer to environmental variability (climate extremes, epidemics, natural disasters, reduction of available natural resources), as well as changes in the social environment (economic and political upheavals such as rapid changes in world markets or migration flows, tourism, development infrastructure, social-spatial transformations, economic crises and uncertainty, health risks) (Pavicevic, 2016)[2]. Resilience can be broadly defined as "the ability of a system, community or society exposed to risk to resist, absorb, adapt and recover from the effects of risk in a timely and effective manner, including the preservation and restoration of the most important basic structures and functions." (UNISDR 2009, 2015) The components of resilience therefore include the ability of the social system to learn, to consider available options and to act flexibly (Schipper and Langston, 2015)[3].

A developed awareness of possible risks and the ability to learn from events with unintended consequences are important elements of preparedness and recovery. The concept of resilience today is directly related to vulnerability[4] and global framework of disaster risk reduction policy. In addition to the fact that improving the condition of vulnerable urban areas has become one of the key Millennium Development Goals, it is extremely important that the

[2]Social resilience is defined as the capacity of social entities (individuals, groups, communities, organizations) to respond positively to adversity. A capacity that includes components of resilience, recovery and creativity. Resilience refers to the efforts of a community to withstand a disaster and its consequences, recovery refers to the community's ability to overcome disasters, and creativity is the ability to speed up and optimize recovery at all levels of the community from multiple aspects and reach the level of functioning before the disaster ( Pavicevic 2016).

[3]At the Council of Ministers of the OECD members in Paris in 2014, the overview document OECD - *Overview Paper on resilient Economies and Societies* was adopted. Four pillars of resilience are clearly delineated in this document: resilience of the economy (economic resilience, as a narrower term), resilience of society, resilience of institutions, ecological resilience.

[4] Vulnerability is a product of physical exposure to natural hazards as well as human capacities to prepare, respond and mitigate their negative consequences (Pelling and Uitto 2001). Vulnerability represents a social, political-ecological concept, that is, it is conceptually located in the interaction of nature and culture. According to Oliver-Smith, vulnerability connects social and economic structures, cultural values, norms and environmental hazards (Oliver-Smith 2004). Vulnerability can be seen as the knowledge that some citizens face a greater risk of injury, death or property loss due to their social and economic circumstances (Phillips and Morrow 2007)

United Nations International Strategy for Disaster Reduction (UNISDR) works together with its partners to raise awareness and commitment to sustainable development practices that will reduce the risk of disasters and increase the well-being and safety of citizens - investing today for a better tomorrow. International Strategy for Disaster Risk Reduction (*United Nations International Strategy for Disaster Reduction* UNISDR) reformulated in 2009 the definition of disaster risk reduction in a way that aligns and more closely links resilience and disaster risk reduction: *The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse effects* (UNISDR , 2009). In contrast to the traditional approach to disaster management that focused on emergency preparedness and disaster response, the new paradigm of disaster risk reduction shifts the focus to risk prevention and mitigation. Building on previous campaigns focusing on education and safety in schools and hospitals, UNISDR partners launched a new campaign in 2010: “Making cities resilient". This international campaign sought to convince city leaders and local governments to commit to the List of Ten Essentials for Making a City Resilient, as well as to work together with local activists, social networks and national authorities. UNISDR, in cooperation with partners, developed this List as a starting point for all those who want to join the campaign. The important fact is that the commitment to these ten essentials has strengthened local governments and numerous agencies for the implementation of the Hyogo Framework for Action 2005-2015: Building the resilience of countries and communities to disasters, which was adopted by 168 governments in 2005. The Hyogo Framework had certain gaps that needed to be filled, but the idea of resilience was reiterated in the Sendai Framework for Disaster Risk Reduction as: strengthening preparedness for effective response, recovery, rehabilitation and reconstruction in line with the "build back better" philosophy, which together strengthens disaster resilience.

The international campaign proposes a list of Ten Essentials for a Disaster Resilient City, which can be implemented by mayors and local governments. This list emerged from the five priorities of the Hyogo Framework for Action 2005-2015: Building the resilience of states and communities to disasters, a key instrument for implementing disaster risk reduction. Achieving all, or even some, of the ten essentials will help cities become more resilient: 1) To establish organization and coordination, in order to reduce the risk of disasters, based on the participation of civil associations and civil society. Build local alliances. Ensure that all competent authorities understand their role in reducing disaster risk and creating preparedness for these risks; 2) Establish a disaster risk reduction budget and provide incentives to homeowners, low-income families, communities, businesses, and the public sector to invest in reducing the risks they face; 3) Maintain updated hazard and exposure data, prepare a risk assessment and use it as a basis for urban plans and decisions. Ensure the availability of this information and plans to the public, allow the public to discuss them; 4) Invest in, and maintain, critical risk-reducing infrastructure, such as flood sewers, adapted as needed to cope with climate change; 5) Assess the security of all schools and health institutions, improve and upgrade them as needed; 6) Apply and enforce realistic, risk-adjusted building regulations and spatial planning principles. Identify safe spaces for low-income citizens and develop a system of improvements and upgrades; 7) Ensure that schools and local communities adopt disaster risk reduction education and training programs; 8) Protect ecosystems and natural barriers to mitigate floods, storm surges and other hazards that your city may be exposed to. Adapt to climate change, relying on good risk reduction practices; 9) Introduce the structure of early warning and emergency (crisis) management capacities in your city, as well as maintain regular public preparedness exercises; 10) After any disaster, ensure that the needs of survivors, and centres of activity are restored and reconstructed, by supporting them and their

communities in designing and implementing mechanisms, economic growth and employment, as safer and well-run cities attract more investment.Bearing in mind the above analysis, the recent UN-Habitat agenda is also important, according to which: “Safer and more resilient cities are based on local government instruments that promote good governance, adequate urban planning and governance as a means to resolve crime, violence, conflict and insecurity in cities and human settlements. It is a multi-sector and multi-disciplinary approach that is applied at the local community-based level, focused on the inclusion of all stakeholders and cooperation in order to achieve safety and security for all." (UN-Habitat, 2016). Also, as Pusic states, if we want "our city" to be a "good city" in the future, it is necessary for all stakeholders to advocate for: 1. non-exploitative attitude towards nature; 2. responsibility of city administrations and leaders towards public goods; 3. a developing city economy that is able to respond to all people's needs; 4. adequate protection and education; 5. open, tolerant, stimulating and egalitarian social structure; 6. citizens who are identified with a positive city life and devote themselves to such a life and 7. the relatively small size of the settlement, so as to facilitate all positive efforts and mutual balancing of the indicated conditions (Pusic, 1997, 398).

The new 2017 Disaster Resilience Scorecard for Cities contains a set of assessments that will enable local governments to monitor and review progress and challenges in implementing the Sendai Framework for Disaster Risk Reduction 2015-2030, as well as to assess their resilience to disasters. The Scorecard is organized by area that follows UNDRR's Ten Essentials to Make Cities Resilient. Disaster resilience, and therefore this Scorecard, covers a city's ability to understand the disaster risks it may face, to mitigate those risks and to respond to disasters that may occur in order to minimize immediate and long-term casualties and damage to sources of income/livelihood, property, infrastructure, economic activities and the environment. However, it also means that those who manage and plan must consider chronic pressures that can affect livelihoods or the severity of a disaster that has caused an acute shock, as they can undermine a city's ability to respond and adapt to a disaster. For example, deforestation can increase the risk of flash floods, and disadvantaged communities (who typically lack insurance) may not be able to rebuild their homes and businesses after a major earthquake. The Scorecard is organized by area following the "Ten Essentials to Make Cities Resilient", which were first compiled in the Hyogo Framework for Action in 2005, then updated to support the implementation of the Sendai Framework for Disaster Risk Reduction for period 2015-2030. The Ten Essentials for Making Cities Resilient broadly cover a number of issues that cities must address in order to become disaster resilient: 1) Organize themselves for disaster resilience, 2) Identify, understand and use current and future risk scenarios, 3) Strengthen financial capacity for resilience, 4) Achieve resilient urban development and design 5) Preserve natural shock absorbers to improve the protective functions of natural capital 6) Strengthen institutional capacity for resilience, 7) Understand and strengthen social capacity for resilience, 8) Increase infrastructure resilience, 9) Ensure effective disaster response, 10) Speed up recovery and build a better system than before a disaster.

Resilience of cities is the current topic of the global document of the UN Agenda 2030 entitled "Transforming our world: the 2030 Agenda for Sustainable Development. Within the 17 new goals of sustainable development, goal 11 is defined as - Make cities and settlements inclusive, safe, adaptable and sustainable, in which it is emphasized that cities are incubators of ideas, centres of trade, culture, science, productivity, social development and much more. In all countries, inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable planning and management of settlements should be improved. The sub-goals also mention the need to protect the world's cultural and natural heritage; protection against natural disasters, aimed especially at poor and vulnerable groups; enabling access to green and

public areas, especially for women and children, the elderly and people with disabilities. The negative impact of cities on the environment should be reduced, with special attention to air quality and waste management at local and other levels. Also, positive economic, social and ecological links between urban, peri-urban and rural areas should be supported, by strengthening national and regional development planning. Cities and other settlements should implement integrated policies and plans in terms of inclusion, resource efficiency, mitigation and adaptation to climate change and resilience to natural disasters (2030 Agenda for Sustainable Development). Making Cities Resilient 2030 or MDG2030 is a new, unique initiative that reaches out to different stakeholders to improve local resilience by advocating, sharing knowledge and experiences, strengthening networks for mutual learning of cities, providing access to technical expertise, connecting multiple levels of government and building partnerships. By providing a clear roadmap for urban resilience, access to knowledge, monitoring and reporting tools, MDG2030 will support cities on their journey to reduce risk and build resilience. Building on the successes and lessons learned from the implementation of the previous decade-long MDG Campaign, the MDG2030 initiative was co-created by Major Partners, including the C40 Cities; ICLEI - Local Authorities for Sustainability, International Federation of Red Cross and Red Crescent Societies (IFRC); Japan International Cooperation Agency (JICA), Resilient Cities Network ( R-Cities), United Cities and Local Governments (UCLG), United Nations Habitat Program (UN-HABITAT), United Nations Office for Project Services (UNOPS), World Bank Group and World Council on Cities Data (WCCD), whereby the United Nations Office for Disaster Risk Reduction (UNDRR) acts as the Secretariat. The MDG2030 initiative was launched in October 2020 and will be active from January 2021 until the end of 2030.

## 4. CONCLUSION

As centres of all innovation and complex systems, megacities can usually offer people the best opportunities for fulfilling and satisfying lives. If they are not managed well, productivity and quality of life are exposed to adverse effects. Introducing the topics of resilient cities and disasters into the domain of politics is the first but very important step, as most political leaders have become aware of the risks that climate change and natural disasters bring and the need to respond to them. It is also necessary to point out an equally important fact - that the topic of global changes, which include the area of natural disasters, must become part of the concerns of institutions and citizens. A sound urban and local administration, as the institutional level closest to citizens, is the key to creating such resilience. The role of civil society, planners and experts in the field of urban planning from different sectors, as well as social groups, is also essential to help develop innovative solutions and to get involved in the activities of local authorities, in order to reduce hazards and encourage good governance through joint work. Numerous international institutions, campaigns, global and regional projects continuously monitor high risks of different origins in cities and agree that the solution lies in well-planned and resilient cities, not only for reducing infrastructural, economic, social and environmental issues, but also for generating creative solutions to improve the environment. Through the latest participation in the MDG2030 initiative, cities and local governments are expected to commit to building their resilience. MDG2030 expects: 1) an increasing number of cities and local governments that are committed to understanding resilience and risk reduction, 2) an increasing number of cities and local governments that are committed to developing strategies for disaster risk reduction or resilience, 3) an increase in the number of cities that are committed to the implementation of actions of resilience and disaster risk reduction and the introduction of resilience and disaster risk reduction into the mainstream of sustainable urban development, 4) cities progressing from awareness to planning for resilience/disaster risk

reduction, 5) an increasing number of cities progressing from planning to implementation disaster risk reduction action.

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