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BUILDING RESILIENCE OF URBAN COMMUNITIES PRONE TO HAZARDS: INTERNATIONAL AND NATIONAL LEGAL FRAMEWORK

Abstract

Destructive potential of hazards caused by anthropogenic activities or natural forces in densely populated areas of urban communities is reflected in jeopardizing human lives, material damage and disruption of the functioning of critical infrastructure. Analysis of legislative aspects of urban community resilience can determine indicators of the quality of the legislative and institutional framework in the field of disaster risk reduction as well as the readiness of legislative bodies to standardize prevention programs for institutional and non-institutional actors. This paper will also point out the introduction of the adaptive law paradigm in Common-law system as a response to the nonlinear dynamics of hazard-generating environments. Legally grounded response of the subjects of interest to the threats caused by fires in urban communities is one of the crucial conditions for acquiring the epithet of a resilient urban community in the sphere of response to the aforementioned type of hazard.

Key words: international regulations, national regulations, resilience, urban communities, hazards.

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INTRODUCTION

Process of rapid urbanization has generated numerous development opportunities while increasing the vulnerability of urban communities to the threats created by natural forces or anthropogenic activities. Modern urban communities represent a system of a high degree of complexity, which parts are in the mutual relationship of interdependence and synergetic action. According to the United Nations, by 2050, 68% of the world's population will live in cities (UN DESA, 2018). Economic and social inequality in overcrowded urban areas affects the accumulation of risks and enhances the vulnerability of different parts of the system to hazards (fires, earthquakes, floods ...), ultimately leading to loss of human lives and large-scale material damage.

The concept of resilience began to be used in the 70s of the last century in scientific papers in the field of technical sciences with the aim of describing the resistance, elasticity and durability of materials under the influence of load (Gordon, 1978). The first use of this concept in the social sciences was noted in 1981 in the context of the interaction between nature and society as a framework for measuring the ability of the system to absorb the negative effects of natural disasters and recover quickly without lasting consequences (Timmerman, 1981). Scientists gathered in the early 1990s as part of a project called the Resilience Project, funded by the Swedish Beijer Institute, made a major contribution to building the theory of resilience (Gao, 2018). The result of a five-year project in which scientists from the field of natural and social sciences collaborated was the Panarchy - a cycle in which the renewal and reorganization of significant dynamic activities that connect natural and social systems (Holling and Gunderson, 2002). This theoretical concept is based on the premise that with increasing efficiency and productivity, the system becomes vulnerable to stressors such as natural disasters, which leads to the collapse of its functionality, leading to a process of reorganization and renewal (Gao, 2018). In the world greatest powers security strategies, the concept of resilience is tested through the predictive function of these documents (Keković and Dinić, 2016, p. 1141–1156) while at the theoretical level within the security studies

can be viewed in two ways, in the form of the desired state of the system or risk management strategy in the context of events with a high degree of uncertainty (Keković and Ninković, 2020, p. 153). A comprehensive explanation of international and national regulations significance is extremely important for understanding the process of building urban communities resilience prone to wide range of hazards.

BUILDING RESILIENCE OF URBAN COMMUNITIES PRONE TO HAZARDS

Resilient communities can be defined as communities whose organizational structure is designed to mitigate the negative effects of disasters and which at the same time have the ability to recover quickly and revitalize the functioning of the socio-economic dimension of the community (Fuchs and Thaler, 2018). Resilience of cities is a complex phenomenon whose manifestations can be determined only after the recorded experience with a certain type of hazard (Moreton, 2016, p.27). The concept of resilience is a feature of the system, and the application of systems thinking is essential (Olsson et al., 2015). Cities as complex systems have five interdependent dimensions: spatial features, organizational, physical, functional attributes and a time dimension that negates static forms and encourages continuous development (City Resilience Profiling Tool).

An in-depth understanding of the functioning of all segments of urban communities exposed to some type of hazard is achieved *ex post facto* by using an analytical framework in the form of four cascading capacities of resilience: preventive, absorptive, adaptive and restorative capacities. Each of these capacities is made up of resources mobilized by the urban community with the aim of building a system capable of coping with external or internal stressors, maintaining vital system functions, adapting to new circumstances with a demonstration of recovery. Carl Gibson, a pioneer in establishing the concept of resilience in security studies, believes that activities undertaken to build the

resilience of urban communities can be grouped into several clusters (Gibson, 2020, p.64):

- development and understanding of the context of community, resources, strengths and weaknesses, interdependence of parts of the system; understanding and classifying hazards; understanding and prioritizing other challenges affecting the urban community; mapping risk areas and vulnerable populations;
- establishing and developing cooperation through identification of entities of importance in the internal and external environment, their needs and contributions to the community;
- planning to improve resilience through identification of priorities for action and access to resources as well as their allocation.

Fire prevention is of particular importance in urban areas due to the permanent presence of a large number of people in a limited geographical location and the fact that cities have extremely complex interdependent infrastructure systems. International and national legislation is an important segment of the preventive capacities of urban communities facing fire hazards, while the implementation of norms in subsequent resilience capacities confirms the legitimacy of the entire legal system of the state in which the urban community is located. According to Cvetkovic, countries that develop policies, legislation and an institutional framework for disaster risk reduction have greater risk management capacity in all sectors of society (Cvetković, 2020, p.583).

Detailed knowledge of legal solutions in the field of disaster risk reduction is mandatory for all employees in the civil protection system of the Republic of Serbia. Compliance of the employees of the civil protection system with the Constitution, laws and bylaws is necessary for the implementation of proactive activities, successful response to fire hazard and recovery process, which leads to establishing a sequence of cascading capacities resulting in community resilience.

NATIONAL REGULATIONS ON BUILDING RESILIENCE OF URBAN COMMUNITIES PRONE TO FIRE

The frequency of fires in urban areas on the territory of the Republic of Serbia, the number of casualties and the material damage caused indicate the urgent need to prevent the occurrence of this form of security threat in the future. The Constitution of the Republic of Serbia determines security of citizens as a general category that is subsequently operationalized by laws and bylaws within individual areas of social life in which there is a need and interest in standardization. Creators of the National Strategy for Protection and Rescue in Emergency Situations (National strategy for protection and rescue in emergency situations , 2011) paid great attention to forest fires, while fires in urban areas are normatively regulated by the Law on Disaster Risk Reduction and Emergency Management (Law on Disaster Risk Reduction and Emergency Management, 2018) and Fire Protection Act (Fire protection act, 2018-50).

Building community resilience has been recognized for the first time by the national legislator under the Law on Disaster Risk Reduction and Emergency Management, which states that disaster risk reduction refers to the application of a set of measures that "strengthen community resilience and preparedness for response and mitigation of disasters, which strengthens the community's resilience. "(Law on Disaster Risk Reduction and Emergency Management, article 2/5).

The Law on Fire Protection explicitly states the subjects, measures and supervision over the implementation of fire protection, the manner of achieving protection, the principles of action (publicity, solidarity, prevention ...) and penal provisions. Article 4 defines fire resilience in the context of an object affected by fire and the properties that a given object exhibits under the destructive influence of the aforementioned stressor. Numerous bylaws (decrees and regulations) specify more precisely the technical norms important for the field of fire protection in urban areas.

Institution	Regulation title
<i>National Assembly of the Republic of Serbia</i>	<p>National strategy for protection and rescue in emergency situations „<i>Sl. Glasnik RS</i>“ No. 86/2011</p> <p>Law on Disaster Risk Reduction and Emergency Management „<i>Sl. Glasnik RS</i>“ No.87/2018</p> <p>Fire protection act „<i>Sl. Glasnik RS</i>“No.87/2018-50</p> <p>Law on Health Care, “<i>Sl.Glasnik RS</i>“ No. 25/2019</p> <p>Law on Inspection Supervision, “<i>Sl.Glasnik RS</i>“ No. 95/2018</p> <p>Law on Housing and Maintenance of Buildings, “<i>Sl. Glasnik RS</i>“ No. 9/2020</p> <p>Law on Voluntary Firefighting, “<i>Sl.Glasnik RS</i>“ No. 87 / 2018-50</p> <p>Law on the Red Cross, “<i>Sl.Glasnik RS</i>“ No. 107/2005</p> <p>Law on Critical Infrastructure, “<i>Sl.Glasnik RS</i>“ No. 87/2018</p>

<i>Government of the Republic of Serbia</i>	<p>Decree on the classification of facilities, activities and land into fire risk categories, "Sl.Glasnik RS" No. 76/2010</p> <p>Decree on the content, manner of preparation and obligations of entities in connection with the preparation of disaster risk assessment and protection and rescue plans, "Sl.Glasnik RS" No. 102/2020</p> <p>Decree on the composition, manner and organization of the work of emergency headquarters, "Sl.Glasnik RS" No. 27/2020</p> <p>Decree on conducting evacuation, "Sl.Glasnik RS" No. 22 / 2011-4</p> <p>Rulebook on the manner of preparation and content of the fire protection plan of the Autonomous Province, local self-government units and entities classified in the first and second category, "Sl.Glasnik RS" No. 73/2010</p> <p>Rulebook on technical norms for installations of hydrant fire extinguishing network, "Sl.Glasnik RS" No. 3/2018</p> <p>Rulebook on technical norms for fire protection of residential and business buildings and public buildings, "Sl.Glasnik RS" No. 22/2019</p> <p>Rulebook on technical requirements for fire safety of external walls of buildings, "Sl.Glasnik RS" No. 6/2019</p> <p>Rulebook on technical norms for protection of industrial facilities from fire "Sl.Glasnik RS" No. 1/2018</p> <p>Rulebook on technical norms for protection of catering facilities from fire, "Sl.Glasnik RS" No. 20/2019</p> <p>Rulebook on technical and other requirements for determining the fire load and the degree of fire resistance, "Sl.Glasnik RS" No. 74/2009</p> <p>Rulebook on technical norms for protection of high buildings from fire, "Sl.Glasnik RS" No. 103/2018</p>
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Table 1: the most significant positive regulations of the Republic of Serbia relevant for determining the legal framework of building community resilience prone to fire (source: author)

INTERNATIONAL REGULATIONS IN THE FIELD OF BUILDING HAZARD-EXPOSED URBAN COMMUNITIES

Normative regulation in the area of disaster risk reduction at the international level began during the last decade of the 20th century with the adoption of the Yokohama Strategy for a Safer World. The creators of the Strategy have determined the most important principles: risk assessment must be an integral part of all activities undertaken in the field of disaster reduction; preventive action must be implemented in every aspect of creating institutional responses at different levels; capacity building for disaster response must be a leading imperative in the future; the vulnerability of certain social groups can be reduced by educational programs (Cvetković, p. 591).

The basic document of the international regulation in the field of disaster risk reduction was adopted in 2000 under the auspices of the United Nations with the title "International Strategy for Disaster Risk Reduction (ISDR)". Following the adoption of the strategy, some authors pointed to a noticeable change in strategic documents at the global level, noting the shift of the previously established focus of preventive action and risk mitigation to coping capacities and risk preparedness (Selmi et al., 2015, p. 164-176).

The principles of the European Strategy for Disaster Risk Reduction in Developing Countries (2009) are aimed at strengthening EU cooperation among member states and developing countries, primarily in the field of prevention, disaster response and reconstruction, and as such are of particular importance in strengthening cooperation in risk reduction. disaster at the regional level (Few and Anagnosti, 2010).

Adoption of the Hyogo Framework for Action for the period 2005-2015 within the framework of the United Nations World Conference on Disaster Risk Reduction (Hyogo Framework for Action 2005-2015) has a paramount importance because of the establishment of a global initiative to build nations and communities resilient to disasters. Building hazard-resilient communities has been set as one of the strategic goals, with disaster prevention, elevating pre-

paredness and vulnerability reduction at all levels, as well as the systematic incorporation of risk reduction approaches into preparedness, response and recovery programs for affected communities (Hyogo Framework for Action 2005-2015). The creators of the Hyogo Framework expressed an attitude that building a security culture and resilience at all levels is possible with the help of knowledge, innovation and educational programs, as well as the engagement of media in raising awareness through social marketing.

The session of the Third World Conference on Disaster Risk Reduction in the Japanese city of Sendai ended with the adoption of the final document conceived as an upgrade of the Hyogo Framework for Action. Sendai Framework (Sendai Framework for Disaster Risk Reduction 2015-2030) as a successor to the mentioned document was created with the intention to anticipate, plan and reduce disaster risk in order to protect individuals, communities and countries, which ultimately leads to building resilience (Sendai Framework for Disaster Risk Reduction 2015-2030).

Within the Sendai Framework, priority measures to be implemented in normative frameworks at the local, national, regional and global levels are exhaustively listed, such as:

- understanding the risk of disasters
- strengthening disaster risk management systems
- investing in disaster risk reduction with the aim of building resilience
- improving the readiness for efficient response and building a system that will overcome the weaknesses of the previous one (Sendai Framework for Disaster Risk Reduction 2015-2030)

General provisions of international regulations in the field of building resilience of urban communities to some form of security threat are operationalized within the strategies adopted by specialized United Nations agencies and professional associations. The Platform for cooperation of fire brigade units of the European Union member states (FEU) was created in accordance with the Solidarity Clause promoted under the Lisbon Treaty (Pan European Fire

Strategy 2020: A safer Europe for all). The resilience of local communities to fires can be realized by strengthening cooperation and raising the level of crisis communication between employees in the civil protection systems of EU member states, participating in joint exercises and expanding cooperation to countries outside the EU.

The process of rapid urbanization and the exposure of cities to a large number of hazards have given rise to the need to create specialized United Nations programs to solve the problem of urban settlement development. UN Habitat was established in 2002 with the aim of promoting sustainable urban development and reducing poverty in cities (UN Habitat Programmes). As part of the Third Conference held in Ecuador in 2016 (Habitat III), a document of special importance for directing urban development called the New Urban Agenda was adopted (UN New Urban Agenda). The signatories of the Agenda have committed themselves through the listed 175 areas of action that the construction of resilient cities will be based on shifting the focus from a reactive to a proactive approach, the essential feature of which is reflected in a comprehensive risk assessment and "*Build Back Better*" principles.²

The UN Habitat program called "*City Resilience Profiling Program*" and the accompanying document "*City Resilience Profiling Tool*" were created as a framework for action by local authorities and relevant stakeholders in their efforts to strengthen preventive, absorptive, adaptive and restorative capacities mobilized in the case of community exposure to stressors from the external or internal environment with the ultimate goal of building resilient urban communities (*City Resilience Profiling Tool*). The documents contain specific instructions for generating city resilience profiles based on dimensions that are unique to each urban community individually.

² "*Build Back Better*" principles represent a holistic concept of the Sendai Framework for Action (2015-2030) and refer to disasters as initial capsules for building resilient communities and nations

<i>International regulations</i>	<p>Yokohama Strategy, Plan of Action for a Safer World-Guidelines for Natural Disaster Prevention, Preparedness and Mitigation (1994)</p> <p>The United Nations International Strategy for Disaster Risk Reduction, UN GA Resolution 54/219</p> <p>European Startegy for Supporting Disaster Risk Reduction in Developing Countries, Brussels (2009)</p> <p>Pan European Fire Strategy 2020, A Safer Europe for All, Federation of European Union (FEU) Fire Officers Associations (2012)</p> <p>The Sendai Framework for Disaster Risk Reduction 2015-2030, the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan (2015)</p> <p>New Urban Agenda, United Nations Conference on Housing and Sustainable Urban Development (Habitat III), Quito, Ecuador (2016)</p> <p>UN Habitat: City Resilience Profiling Programme (with the support of EU Commission), Barcelona (2019)</p>
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Table 2: the most significant international regulations and programs relevant for determining the legal framework of urban community resilience prone to hazards (source: author)

The concept of urban community resilience and adaptive law in the common-law system

The status of resilience as a constituent of normative acts is often the subject of debate in academic circles at the global level (Thoren and Olsson, 2018, p. 112-128). The Anglo-Saxon legal system, unlike the continental system, recognizes the phrase "adaptive law" which refers to the need to establish a law based on the dynamics of complex, interdependent socio-ecological systems (Arnold and Gunderson, 2013). A legal system that has the ability to adapt to change has an extremely important role in strengthening the overall adaptive capacities of social communities facing external or internal stressors.

According to Arnold, the signs of rigidity of the legal system of the United States can be seen in the existence of court precedent, legal processes based

on pre-determined decision-making as well as fragmentary observation of social reality (Arnold, 2013, p.245). The system of adaptive law is polycentric, power is dispersed and thus the possibility of system collapse is significantly reduced. Adaptive law enhances the resilience of social communities through "gradual development of rules, standards, processes and structures" (2013, p.260) in parallel with adapting the system to a dynamic environment.

Gunder and Arnold, exponents of adaptive law as new paradigm, emphasize the importance of adopting legal regulations at the local level in order to achieve "poly-resilience" (*ibid.*) or resilience of all systems and subsystems of urban communities due to the existence of a high degree of interdependence at different levels.³

<i>Characteristics</i>	Maladaptive (rigide) law	Adaptive law
<i>Goals</i>	Improving the stability of individual systems.	Multiple forms of resilience: resilience and adaptive capacity of social and ecological systems, including associated subsystems in the form of institutions and communities.
<i>Structure</i>	The law is monocentric, using fragmentary and unimodal answers to problems.	The law is polycentric, using multimodal answers to problems that are insufficiently integrated.
<i>Methods</i>	The law controls society through rules, restrictions on action and authority, requirements for certain outcomes, and legal abstractions that are resistant to change.	The law facilitates socio-ecological resilience through moderate adaptation to changing conditions, tolerates uncertainty, and allows for flexible discretionary decision-making.
<i>Processes</i>	The law implies linear decision-making by one authority.	The law recognizes established processes through feedback that takes place between a large number of participants.

Table 3: Comparative perusal of the characteristics of maladaptive and adaptive law in the Anglo-Saxon legal system (Arnold and Gunderson 2013, p. 5)

³ An illustrative example could be the initiative to adopt stricter regulations banning open fires in urban areas, which simultaneously protects the security of citizens and the environment; environmental protection generates multiple profits in socio-ecological systems.

The monocentric approach of rigid legislation is characterized by management lines generated by the central authority and the ability to transfer the internal or external shocks experienced by the system through each segment of society creating a cascading effect (Arnold and Gunderson, 2013, p.5). On the other hand, polycentric systems are characterized by the dispersion of power and the existence of multiple control lines, which creates the conditions for the amortization of negative influences that usurp the system.

The process of adaptation, as one of the crucial features of the resilience of urban communities, places demands on the adjustment of all segments of the system aimed at neutralizing the possibility of interference due to interdependence in the functioning of vital functions of the system and jeopardizing its identity features. The need to apply adaptive law can be justified by desire to establish a legal framework that can follow nonlinear dynamics of urban communities prone to a certain type of hazard.

CONCLUSION

Dynamics of changes in contemporary environment have imposed the process of adaptation as the ultimate ability of socio-ecological systems in order to survive. The process of urbanization in the world of constant increasing interdependence between numerous actors at different levels and spatial distance has created conditions for progressive socio-economic development, with the simultaneous emergence of various forms of hazards that can jeopardize welfare of population and the environment. Resilience theory provides a coherent framework for creating systems that act proactively, mobilize adequate resources in the process of responding to destructive influences, adapt to a changed environment and recover rapidly while preserving vital system functions and identities.

Building urban communities resilient to hazards that test preventive, absorptive, adaptive and restorative capacities requires a holistic approach. Synergistic engagement of institutional and non-institutional actors (combination of

so-called "top-down" and "bottom-up" approaches) is a necessary requirement for achieving the desired state of the system and creating strategies for urban communities prone to hazards caused by human factors and natural forces.

Within the framework of international regulations, building community resilience is presented in the form of guidelines designed for national, regional and local authorities such as emphasizing the importance of developing and periodically updating civil protection and rescue plans in emergency situations, implementation of early warning systems, critical infrastructure protection, social marketing, training of volunteers, cooperation between institutional and non-institutional actors at different levels. General provisions of extensive international legislation are operationalized in national legal frameworks through laws and bylaws. The Law on Disaster Risk Reduction and Emergency Management introduces the term resilience in the context of the ability of a community in responding adequately to stressors and recovering without disrupting key systemic functions.

The subsystems on which the overall functioning of urban communities largely depend (such as economic, political, infrastructural and legal) create frameworks for subjects to act with the aim of building resilience to a particular type of hazard. Adopting legal norms that accompany dynamic changes and allow polycentric decision-making can give through the wide network of interconnectedness a great contribution in building resilient communities to stressors coming from the internal or external environment.

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ИЗГРАДЊА РЕЗИЛИЕНТНОСТИ УРБАНИХ ЗАЈЕДНИЦА НА ХАЗАРДЕ: МЕЂУНАРОДНИ И НАЦИОНАЛНИ ПРАВНИ ОКВИР

Апстракт

Деструктивни потенцијал опасности изазваних антропогеним активностима или дејством природних сила у густо насељеним зонама урбаних заједница огледа се у угрожавању великог броја људских живота, наношењу материјалне штете и поремећајима у функционисању критичне инфраструктуре. Анализом легислативних аспеката резилијентности урбаних заједница могу се утврдити индикатори квалитета законодавног и институционалног оквира у сфери смањења ризика од катастрофа као и спремности законодавних тела да нормирају превентивне програме намењене институционалним и ваниинституционалним актерима. У склопу рада биће указано и на појаву парадигме адаптивног права у англосаксонском правном систему у форми одговора на нелинеарну динамику окружења које генерише хазарде. Законски утемељен одговор субјеката од интереса на опасности изазване пожарима у урбаним заједницама један је од круцијалних услова за стицање епитета резилијентне урбане заједнице у сфери одговора на наведни тип хазарда.

Кључне речи: међународни прописи, национални прописи, резилијентност, урбане заједнице, хазарди.

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