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FLOODS IN THE REPUBLIC OF SERBIA – VULNERABILITY AND HUMAN SECURITY

Abstract: Vulnerability and human security have been changing over time and depended on the physical, social, economic and environmental factors. In modern terms these phenomena have become multi-dimensional, multi-disciplinary, multi-sectoral and dynamic. However, in addition to empirical changes with respect to the nature of security threats, the increase of vulnerability and threatening to human security, there have increased the analytical range in their understanding as well as the institutional changes within the security structures. Many countries have abandoned the attitude that the floods and flash floods as the most important natural hazards can be suppressed or controlled, i.e. that can be fought against or placed under full control. With that regard, *the attitude of adoptive management of security and rescue from floods and flash floods* becomes more and more prevalent, as well as flood risk adjustment or the principle of “*living with floods*”. Accepting such attitude, relating cultural values of the society, economy, institutional and functional possibilities for the purpose of mitigating vulnerability and providing human security proved prominent in the Republic of Serbia. The state has taken a series of reform steps in view of recognizing its own physical exposure to food risks. At the same time, after such great floods which endangered a large part of the country’s territory, the country recognized its social-economic weaknesses of the community, as well as the necessity to increase the capacity to mobilize the resources in mitigating vulnerability and facilitating human security.

Key words: *community, vulnerability, floods, resources, human security.*

1. INTRODUCTION

Regardless of the obvious differences in the approach to the phenomenon of vulnerability, it is always and primarily focused on the physical and social dimension of a community. “Vulnerability is a dynamic concept [which] (...) refers to an inability to cope with risks, shocks and stress” (Vasta 2004). “A condition or set of conditions which adversely

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affect people's ability, to prepare for, withstand and/or respond to a hazard" (Warmington 1995). "Vulnerability is a product of physical exposure to natural hazard, and human capacity to prepare for or mitigate and to recover from (cope with) any negative impacts of disaster" (Pelling and Uitto 2001:50). According to Oliver-Smith vulnerability interconnects social and economic structures, cultural values, norms and environmental hazards (Oliver-Smith 2004). In search of the new approach to vulnerability Cardona (Cardona 2004) concludes that vulnerability results from: a) physical exposure, or rather susceptibility of the social community to be affected by the hazard; b) social and economic weaknesses, which implies the relative weaknesses and shortcomings which characterize the community in the social and economic sense; c) lack of resilience, which is expressed through inability and limitation of the society to mobilize the existing capacities. It is multi-dimensional, multi-disciplinary, multi-sectoral and dynamic (UNEP 2007). The level of vulnerability is changing over time and depends on physical, social, economic and environmental factors (UNU Institute for Environment and Human Security 2004). On the other hand, the analyses and considerations of the concept of human security show that security as well as vulnerability are re-defined to incorporate new aspects in relation to the traditional ones, namely: "safety from the constant threats of hunger, disease, crime and repression" as well as "protection from sudden and hurtful disruptions in the pattern of our daily lives" (Human Development Report, UNHDR 1994:23).² As is noted by Bruderlein, "human security refers to the appreciation of people's need for safety, along with the needs of the state, and it minimizes the risks, accepts the preventive measures to suppress human vulnerability and takes recovery measures where preventive measures have failed" (Bruderlein 2001). Therefore, the additional energy which lies beyond human security stems from the knowledge that not only the threats have increased, but also the ability to respond to those threats: "Nowadays, there is an increasing opportunity to join our efforts and understanding in order to achieve better coordination. Technology and political changes have increased the prospects for effective coordination, advancement of science continues to expand our knowledge and the resources we use for providing human security are partially available. Therefore, whatever is threatening human security at the moment, there is a fact that the problem is in the inconsistency between the security threats and the mechanisms for their resolution" (Elkir 2006). In the past decades, vulnerability to natural hazards as well as their role in threatening human security again has taken the precedence over technological, military and other hazards threatening the community. Many researchers have suggested that flooding is a social event and research must explore the social context and processes in the community (Fordham 1998; Quarantelli 2005). Institutional policies, such as the UK National Security Strategy, also state that communities play a key role in resilience (Cabinet Office 2008). In recent years, many countries abandoned the view that floods and flash floods can be suppressed and controlled, i.e. that can be "combated" and placed under full control. With that regard, *the attitude of adoptive management of security and rescue from floods and flash floods*, becomes more and more

2 The notion of human security first appeared at the international scene in the Human Development Report 1994 of the United Nations, where it was stated that "the idea of human security, though simple, is likely to revolutionize society in the 21st century". Its predecessors may be found in the documents of the International Committee of the Red Cross, established in Geneva in 1863, as well as in the UN Charter, the Universal Declaration of Human Rights and the Geneva Conventions which imposed to the countries the obligation to defend the security of the people wherever they are located.

prevalent, as well as flood risk adjustment or the principle of “*living with floods*” (Varga, Mladenović 2002:79; Milojković, Mladan 2010:172). Accepting such attitude, relating cultural values of the society, economy, institutional, functional possibilities as well as needs for human security are all clearly visible in the Republic of Serbia. The state has taken a series of reform steps for recognizing its own level of physical exposure to flood risks. At the same time, after enormous floods which threatened a large part of its territory, the state has recognized the social and economic weaknesses of the community, as well as the need to increase the capabilities to mobilize the resources in order to reduce vulnerability and facilitate human security.

2. PHYSICAL ASPECT OF VULNERABILITY AND HUMAN SECURITY - VULNERABILITY OF THE REPUBLIC OF SERBIA TO FLOODS

Occurrence, extent and duration of natural disasters in most cases cannot be predicted in advance, but the occurrence of certain phenomena may be assumed on the basis of experience, statistical data and modelling methods taking into account the place of incidence (Dragicevic et al. 2009; Prohaska et al. 2009).

The territory of the Republic of Serbia is exposed to numerous natural hazards which threaten to cause new consequences all the time. Floods represent the most common natural hazard in the country. The area in Serbia exposed to floods which occur once in a century amounts to 1.57 million ha, out of which 1.45 million ha is in Vojvodina. About 80% of flood exposed area is agricultural land, including 512 bigger settlements, 515 industries, and 4,000 km of roads and 680 km of railway tracks. It is about 1 million ha of agricultural land in Vojvodina, 260 settlements, 3,840 km of roads and about 150 km of railway tracks (National Strategy of Sustainable Development, The Official Gazette of RS, No. 57/08). In the past 13 years, several large-scale floods were registered in Serbia. They occurred in 1999, 2000, 2005, 2006, 2007, 2009, 2010, 2011, 2012 and 2014.

In July 1999, the basins of major tributaries of the river Velika Morava witnessed flash floods when eight people lost their lives, tens of thousands of residential buildings and several hundred commercial buildings were damaged and 30 bridges wiped out in the basins of the Zapadna Morava, the Jasenica, the Kubrišnica and the Lepenica (Milanović, et al. 2010). Those floods were caused by heavy precipitation and they affected all left and certain right tributaries of the Velika Morava and Šumadija region suffered the greatest damage. In March and April 2000, high water levels occurred in the rivers Tisa and Tamiš as a consequence of rapid melting of snow on the slopes of the Carpathians and concurrent heavy precipitation. The situation on the territory of the municipality of Sečanj was the gravest. The floods threatened the town Jaša Tomić as well. During 2001 and 2002, only smaller-scale flooding occurred. In June 2001, the largest floods occurred in the basins of the rivers Jadar, Ždravija, Štira and Lesnička when the municipalities of Loznica, Ljubovija, Krupanj, Mali Zvornik and Šabac were flooded. The largest flash floods occurred in the basin of the river Mlava in June 2002. In July 2005, the floods affected Leskovac, Porečje and Vučje, as well as certain parts of the territories of Niš and Kruševac in the south of Serbia. 27 settlements were flooded on the territory of Kruševac, 82 buildings were left damaged, 2,420 ha of land were flooded, 90 residential buildings were damaged and the roads suffered damage on 23 sections. On the territory of Leskovac, about 25,000 ha of wheat, corn and vegetable fields were ruined, as well as 2,500 households. In April 2006,

the floods affected the municipalities of Žabalj, Titel, Sečanj and Zrenjanin in Vojvodina, as well as Negotin, Veliko Gradište, Smederevo, Požarevac, since the Danube and its tributaries reached the highest levels in the past 100 years. 3,000 houses were flooded, leaving 11,000 people displaced or homeless. It was estimated that 225,000 ha were flooded, which makes 5% of total arable land in Serbia. In November 2007, massive floods took place in the south of Serbia, especially in the basin of the river Vlasina. Apart from this, heavy precipitation occurred within 48 hours in the basin of the river Velika Morava. All this led to flash floods in the basin of the river Velika Morava and its tributaries: the Toplica, the Vaternica, the Nišava, the Vlasina, the Kosanica, the Jablanica. At the beginning of November 2009, great floods took place in Zlatibor and Raška districts. In the following year, 2010, the floods occurred in several municipalities. In Zaječar, the Beli Timok flooded 500 buildings, while the total flooded area was 350 ha. Rapid melting of snow and heavy precipitation threatened the municipality of Kruševac from several rivers: the Južna Morava which threatened to flood 300 ha of arable land, the river Ribarska which flooded 70 ha of land and the river Jablanička which flooded 40 houses and 50 ha of land. Jagodina and Paraćin were threatened by the Velika Morava whereas nearly 300 ha of arable land were flooded. The greatest damage was sustained by Valjevo surroundings during 2011 and 2012 when the river Tamnava threatened to flood 200 houses due to precipitation which continued for several days, while it damaged between 1,500 and 2,000 facilities in the municipality of Koceljeva. The countries of the Danube river basin suffered great damage from floods, while the situation in the Republic of Serbia threatened to become very serious in the municipalities of Novi Sad, Sombor, Apatin, Indija and Beočin, whereas the plan to evacuate 1,200 citizens from 550 houses was prepared.

2.1. Flood risks in the Republic of Serbia in 2014

In the past ten years (2006 stands out in particular) in Serbia there were reported frequent large scale flood events; however, the floods from April and May 2014 surpassed the previous ones in the size of the affected area, water levels, inflows and duration. The recent floods have shown a disturbing realistic picture of vulnerability and human security. Due to the heavy floods affecting several districts, on 15 May 2014 the Republic Headquarters for Emergencies held an extraordinary session when they passed a decision to recommend to the Government to declare a state of emergency³ on the entire territory of the Republic of Serbia in order to utilize the resources from the entire territory and direct them into the affected areas. In accordance with the Report on the natural disaster - flood which struck the Republic of Serbia and the measures taken to rescue people and defend the endangered places, the most affected towns were: Obrenovac, Šabac, Sremska Mitrovica, Mali Zvornik, Krupanj, Ljubovija, Vladimirci, Koceljeva, Šid, Svilajnac, Paraćin, Ub, Lajkovac, Ljig, Osečina, Smederevska Palanka, Trstenik, Bajina Bašta. To achieve more efficient response to the state of emergency, the Republic of Serbia has sent a request for assistance to the international community, the governments of the Russian Federation, Slovenia and

3 The Law on Emergency Situations defines an emergency situation as the state when risks and threats or consequences of disasters, emergencies or other threats to the population, environment and material property are of such scope and intensity that their occurrence or consequences cannot be prevented or remedied by regular activities of competent bodies and authorities, which is why their mitigation and remedy requires the application of special measures, forces and resources in an enhanced mode.

Hungary as well as the European Commission, which was forwarded to all members of European Civil Protection Mechanism.

The preliminary data on the consequences of floods show that the physical aspect of vulnerability came to the fore. In the period from 14 to 20 May 2014, there were 30 bridges destroyed and 50 bridges damaged on the classified roads. Moreover, approximately 200 bridges were destroyed or damaged on the municipal and unclassified roads. Due to landslides or mudslides, over 20 classified roads were damaged and several hundreds of municipal and unclassified roads. *Flash flood* has washed away a part of the railroad in Tamnava (Ub) in the length of 10 km. *Approximately 2,260 residential buildings* and 50 public facilities (mostly elementary schools) *were flooded*, as well as over 300 business facilities. The flood wave reduced the reliability of the power distribution system, especially vital facilities for transmission from the thermal power plant Kolubara and TENT A. Due to the flooding of the river Kolubara, 80% of the territory of the municipality Obrenovac was under the water. On the territory of the Republic of Serbia the total of 31,879 citizens were evacuated, whereby only within the area of Obrenovac 25,000 people were evacuated. As a result of the flood wave 23 people lost their lives. The report on the assessment of the needs for recovery and reconstruction of the flooded area shows that the total damage in all sectors amounts to 1.53 billion Euros.⁴

In response to extremely modified security environment, the state has recognized the need for the engagement of all available resources – ministries, enterprises, organizations and services. The analyses of engagement by the Sector for Emergency Situations show that the entire operating structure of fire and rescue units was engaged, as well as all specialist rescue teams for work on the water. The specialized civil protection unit for rescue on the water and under the water was mobilized. During the emergency situation, the Republic Headquarters for Emergency Situation held four extraordinary sessions, at which they mainly discussed the reports on the measures taken by the Republic Directorate for Water, Public enterprises „Srbijavode”, „Vode Vojvodine” and „Beogradvode”; as well as the activities of protection and rescue by all subjects and further activities of all lower-level headquarters. The Report states that the activities of protection and rescue deployed all forces and resources of the Ministry of Internal Affairs of the Republic of Serbia (approximately 7,300 members). Due to the lack of its own resources, the state accepted the assistance of rescue teams from 13 countries: Russia, Belarus, Slovenia, Bulgaria, Denmark, Czech Republic, Germany, Romania, Austria, France, Hungary, Macedonia and Montenegro as well as the team from United Nations and European Commission. The Serbian Armed Forces have engaged the total of 15,133 members and provided assistance to the civil authorities in the implementation of various activities, from evacuation to water supply and taking care of the vulnerable. The floods have caused numerous serious problems to the power distribution system of Serbia and with that regard the Ministry of Energy and Mining in coordination with other state bodies and energy companies took a number of measures in order to mitigate the consequences of the situation. The Ministry of Civil engineering, Transport and Infrastructure engaged its sectoral capacities: the Department of Civil engineering and Urban Planning, the Department for Rail and Intermodal Transport, the Directorate for Inland Waterways and others. The Ministry of Health engaged its healthcare capacities from their network of healthcare centres. There has been organized

4 www.obnova.gov.rs

the continuous gathering of information on the needs to facilitate health care, available capacities, the data on the demand of health care institutions for certain medicines and medical devices. The Ministry of Agriculture and Environment undertook various activities through their bodies: the Republic Directorate for Water, the Directorate for Plant Protection, the Agency for Environmental Protection, the Veterinary Directorate, and the Directorate for Forests.

The Plan of activities was drawn up by the Ministry of Labour, Employment, Veterans and Social Issues and it included establishment of communication with all centres for social work and social welfare institutions. The Minister of Culture and Information sent an order, on the basis of Article 79 of the Law on Cultural Property (“Official Gazette of RS”, No.71/94, 52/11, 99/11), to the central institutions for protection of the cultural heritage to focus all activities on protection of the immovable cultural heritage: monuments, archaeological sites, places of interest and cultural and historic complexes and on the protection of artistic and historical works of art, archival materials, film materials, old and rare library materials.

Bearing in mind the limited financial resources of the state, the Ministry of Finance, in addition to opening of dedicated dinar current accounts for flood relief, organized a number of discussions and meetings with the representatives of international financial institutions in order to identify the available modalities of financing. The Ministry of Economy engaged the competent institutions: the Privatization Agency, the Development Fund, the Serbia Investment and Export Promotion Agency – SIEPA, and the National Agency for Regional Development. The activities such as: provision of urgent help to citizens, prevention of market distortions, control of price stability, punishing all illegal activities and ensuring continuity in the provision of telecommunication services were taken by the Ministry of Trade, Tourism and Telecommunications. The Ministry of State Administration and Local Self-Government organized around the clock duty for the purpose of faster notification. There was established the cooperation with the Standing Conference of Towns and Municipalities initiating the assistance to the vulnerable units of local self-government. A request for activating the EU Civil Protection Mechanism was sent, along with taking all necessary steps with the aim to ensure help through all available EU mechanisms and funds to which Serbia as a candidate country has access to.⁵

2. 1. 1. The efforts of the Republic of Serbia in devising the resources for response to flood risks

The disturbing changes in occurrence of flood risks called for a new analysis of the situation and institutional changes within the security system. The necessity of the analysis of the threats, vulnerability and protection against natural hazards among which floods play an important part has been defined in the essential national normative and legal state documents. Although these documents do not explicitly define the notion of “vulnerability” and “human security”, they pose the advance in organization of the integrated protection system which would mitigate the consequences of natural hazards. The Constitution of RS (*The Official Gazette of RS*, No. 98/06) as the supreme legal act, in Article 190, defines the

⁵ More information on engagement of all state entities in: Report on the natural hazard – flood that struck the Republic of Serbia and the measures taken for rescue of the people and defense of the endangered towns, 2014.

role and importance of local community in overcoming the potential vulnerability with its own capacities as well as the consequences of natural hazards. The issue of tasks, functions and competences of municipalities and local community is always a current issue as it indicates the real autonomy of local community as well as the potential resources of the local authorities to implement different activities, as well as mitigation of vulnerability to natural hazards. Under the Law on Local Self-government (*The Official Gazette of RS*, No. 129/07), the contemporary local authorities are obliged, beside prevention of social problems, to implement also the prevention, protection against natural hazards and creation of conditions for elimination of their consequences. A unit of local self-government is responsible, *inter alia*, for the following tasks: management of water facilities (Article 23), provision of security against the harmful effects of water and risk management (Article 45), organization and implementation of defence against floods on the waters rank II (Article 53), and also it passes the Operational plan for defence against flooding (Article 55).

The necessity of consideration of natural hazards is also expressed in the National Strategy for Sustainable Development (*The Official Gazette of RS*, No. 57/08) which considers flood protection and encouragement of security against damage incurred by natural hazards as a state priority as well as the process of institutionalization of civil protection system.

The importance of adaptive flood management is defined by the Law on Emergency Situations (*The Official Gazette of the RS*, No.111/09). The law sets forth that protection against and rescue from floods and other hazards on water and under water, includes planning, construction, maintenance and enhancement of the damaged facilities for protection against floods, monitoring and surveillance of water levels, alerting, planning and implementation of evacuation of people and property from endangered areas, removal of water from flooded buildings, locating and extracting victims and the drowned, taking care of the affected citizens and recovery of the flood consequences. This law defines the preparation of the General and Operational Plan by water management authorities and enterprises as well as the competences of the units of local self-government in preparation of Protection and rescue plan. Also, the law defines the obligation of the Republic Hydro-meteorological Institute, Republic and provincial authority for water management and public water management enterprises to notify the competent service and headquarters for emergency situations on water levels, declared phase of defence, situation development and measures taken. The new national Water Law (*The Official Gazette of the RS*, No. 30/10) concretizes the risk of flooding and envisages some of the most important elements in this field: 1. Protection from harmful effects of water and risk management; 2. Affected area; 3. Preliminary flood risk assessment; 4. Vulnerability maps and flood risk maps; 5. Plan of flood risk management; 6. Adoption of the plan of flood risk management; 7. Protection against flood – measures and works; 8. Defence from flood; 9. General plan for defence from floods and operational plan for defence from floods. Also, it is defined that the defence from flood on the waters of first order and drainage systems under public ownership shall be organized and implemented by public water management enterprise, and on the waters of second order the unite of local self-government in accordance with general and operational plan for defence from flood. The General Plan for defence from flood for waters of first and second order and inland waterways is passed by the Government of the Republic of Serbia for the period of 6 years. The Operational plan is prepared by the public water management enterprise in accordance with the General plan, and is passed by the

Ministry responsible for water management on the territory of the Republic of Serbia, no later than on 31 December of the current year for the following year.

In the National Strategy for Protection and Rescue (*The Official Gazette of the RS*, No.86/11) flood is defined as a natural hazard as one of the greatest threats to life, health and property of citizens, environment and cultural heritage.⁶ The Strategy states that the Institute for Development of Water Resources “Jaroslav Černi” has developed the methodology for classification of torrential flows which has been introduced in the Water Management Information System. For the purpose of monitoring of the state and changes of the parameters of hydrological regime of the watercourses in the Republic of Serbia, the state network contains 187 operating hydrological stations, while for the needs of hydrological forecasts and warnings the data from 70 hydrological stations have been collected on a daily basis. The Reports are submitted to hydrological stations, and modern digital equipment for measuring and back-up has been installed as well as the direct access to the data using GPRS service. Bulletins with hydrological data and forecasts, information and warnings of high and low waters and ice conditions are distributed to all participants in the system of defence against flooding and other extreme hydrological phenomena, as well as to the media.

The importance of natural disasters in the Republic of Serbia and the issue of vulnerability of the community has been pointed out by passing the new by-law – Guidelines on the methodology for preparation of the assessment of vulnerability and protection and rescue plans in emergency situations (*The Official Gazette of the RS* No. 96/12). The assessment represents an essential document for development of the Plan for protection and rescue in emergency situations at the level of the Republic of Serbia and the Plan for protection and rescue in the autonomous province, local community governments, legal entities and other companies and organizations. In addition to the other basic elements, a part of the Plan for protection and rescue is also the Plan for protection and rescue in accordance with risk measures, where floods as natural hazards take the first place. The Plan for protection and rescue from floods and destruction of hydro-accumulation dams include: an overview of watercourses and water reservoirs that may be the cause of flooding with an overview of the areas potentially threatened by flooding and underground waters, overview of flood waves (vulnerable areas) resulting from destruction of dams and overflow of water from the river beds, overview of resources for evacuation of people from the affected area into an unaffected area, a list of operational and professional authorities in charge of defence against flooding, operational procedure for coordination, management and the activities of the forces for protection and rescue on and under water, evacuation, treatment, first aid, sanitation and other measures of civil protection. The plan for protection and rescue from flooding involves planning and implementation of measures in case of imminent danger of flooding, as well as planning and implementation of measures on occurrence of floods. The ministry responsible for water management, public water management enterprises, the authorities of autonomous province and the bodies of local self-government units prepare the planning documents and reference maps on the basis of a special law which governs the management of water and protection against harmful effects for water. Moreover, the autonomous province authorities and the authorities of local self-

6 In developing the National Strategy for Protection and Rescue there were taken into account the recommendations of the EU Internal Security Strategy and EU Strategy in supporting disaster risk reduction in developing countries.

government units, the authorized and qualified legal entities and other legal entities prepare their protection and rescue plans as an upgrade to those plans. This plan develops the operational procedures of the entities of protection and rescue in case of floods, defines those in charge of implementation of activities and their tasks, contains the overview of the forces that may be engaged in remedying the consequences and ensures the planned engagement of available resources. Further implementation of defence against floods is governed by the Decree on establishing a general plan for defence against flooding for the period from 2012 to 2018 (*The Official Gazette of the RS* No. 23/12) whereby it is determined: which measures have to be taken preventively and in the period of arrival of high waters (external and internal), the manner of institutional organization of defence against flooding, the duties, responsibilities and powers of the heads of defence, the institutions and other persons responsible for defence against flooding, ice or flooding of internal waters, the manner of surveillance and recording of hydrological and other data, forecast of phenomena and manner of notifying.

The value of the mentioned adopted documents is reflected in recognition of the state's own real vulnerability to flood risk, but also in the compliance with the guidelines and recommendations of the United Nations International Strategy for Disaster Reduction (UNISDR) as well as United Nations Development Program (UNDP) .

3. CONCLUSION

Vulnerability and human security are in modern terms increasingly viewed as cumulative processes interrelated from different aspects and causing a series of other problems, which mutually aggravate further, or give rise to other problems such as social and economic. Vulnerability and human security in terms of manifestation of flood risk are multi-dimensional and characterized by weak infrastructure or rather institutions and their insufficient ability to respond in the preventive and operational terms.

Under the circumstances of manifestation of flood risks, their power combined with vulnerability of all exposed elements may result in endangering human security on a large scale in poor and vulnerable areas, and especially on those places to which the highest economic investments are focused on. The Republic of Serbia is constantly threatened by natural hazards and floods in particular. Flood risks in the last decade, especially floods in May 2014 represent an indicator of extreme vulnerability and endangered human security in the state, as well as its lack of resilience to respond financially, organizationally and functionally to their consequences. The importance of the adopted strategies and laws reflects in the attempt of the state to adapt to flood risk and to create an integrated system which would respond to the real vulnerability and human safety of the community with its own, renewed resources in an organized and functional manner.

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