A CONCEPTUAL FRAMEWORK FOR UNDERSTANDING AND ASSESSING SOCIAL VULNERABILITY

Abstract. A conceptual framework for understanding and assessing social vulnerability is developed. In particular, the essence of this concept is clarified and the scheme for its assessment is constructed. It allows to select indicators for each component of vulnerability (economic, social, environmental, physical and mental) through the lens of disposition, sensitivity and resilience. Such indicator selection will provide a comprehensive assessment of social vulnerability, which is an important basis for its reducing.

Keywords: social vulnerability, hazardous event, exposure, susceptibility, resilience, vulnerability indicators.

Extreme events of natural or anthropogenic nature have huge negative consequences for people all over the world. Obviously, every community must prepare for such events, respond to them in time and prevent their consequences. Social vulnerability assessment is an important basis for developing effective strategies and making operational decisions in the emergency management. The need to assess social vulnerability in order to its reduction is especially relevant today for Ukraine in the context of existing and emerging hazards.

Nowadays there is no general accepted definition of social vulnerability. That is why, first of all, we will try to clarify the essence of this concept. In a broad sense, vulnerable is "those, who is easily and quickly exposed to impact of external factors; susceptible, sensitive" [1]. So, vulnerability can be defined as the inability of a social system to resist harmful influence of an unfriendly environment, its susceptibility,
tendency to change, suffer from loss or damage under the influence of hazardous events. At the same time, enough popular is the understanding of vulnerability as the characteristics of a person, group, or their situation that affect their ability to anticipate, cope with, resist, and recover from different disasters [2, p. 11].

Generally, among the variety of approaches to the definition of social vulnerability, four most common concepts are distinguished: risk-hazard, political economy, political ecology and socio-ecological systems (Table 1). Many definitions include components of not only exposure and susceptibility, but also adaptive capacity. Consequently, we can conclude: although the social system may be negatively affected by hazardous events, is sensitive to them, it also has some ability to cope with or even prevent its consequences.

<table>
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<th>Concept</th>
<th>Definition</th>
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<td>Risk-hazard</td>
<td>&quot;Measure of the capacity to weather, resist, or recover from the impacts of a hazard in the long term as well as the short term&quot; (Milet 1999); &quot;Susceptibility of people and things to losses attributable to a given level of danger, a given probability that a hazard will manifest itself at a particular time, in a particular place, in a particular way, and with a particular magnitude&quot; (Alexander 2002).</td>
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<td>Political economy</td>
<td>&quot;Aggregate measure of human welfare that integrates environmental, social, economic, and political exposure to a range of harmful perturbations&quot; (Bohle et al. 1994).</td>
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<td>Political ecology</td>
<td>&quot;Characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard&quot;(Wisner et al. 2004).</td>
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<td>Socio-ecological systems</td>
<td>&quot;Degree to which a system, subsystem, or system component is likely to experience harm due to exposure or hazard, either a perturbation or stress/stressor&quot; (Turner et al. 2003); &quot;State of susceptibility to harm from exposure to stresses associated with environmental and social change, and from the absence of capacity to adapt&quot;(Adger 2006).</td>
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Taking everything into account, we propose the following definition:

Social vulnerability is a property of the social system, which characterizes the degree of its susceptibility, sensitivity to the harmful effects of hazardous events and, at the same time, the degree of ability to cope with them, resist and recover after disasters. The social context of the concept "vulnerability" indicates that it concerns
society, individuals or groups, their relationships with society, as well as their environment.

Generally, the following characteristics of vulnerability are determined in the scientific literature [4, p. 48]:

– multidimensionality (consists of several components);
– dynamism (changes over time);
– diversity (may vary from household to community, from community to region and from region to country);
– specificity (different for each country or region).

Regarding the multidimensional nature of social vulnerability, four of its components are usually defined: economic, social, environmental and physical [5, p. 322]. In particular, economic vulnerability characterizes the potential impact of hazards on economic processes, property or certain sectors of the economy (disruption or cessation of economic activity, business, increasing poverty, unemployment, loss of labour force, etc.). For assessing the economic vulnerability of some territory the following indicators are used: poverty rate, GDP per capita, unemployment, sources of household income, past experience of danger, total length of the access road associated with the main district road etc.

Social vulnerability primarily concerns certain groups of the population who are unable to cope with disasters on their own. This type of vulnerability regards not only socially vulnerable groups, but also their connections, the nature of relations with society (for example, illegal migrants or discriminated persons on the basis of race or nationality). According to the law about social services, social vulnerable groups have the highest risk of getting into difficult life circumstances due to the influence of different external and / or internal factors. The law defines factors that can cause difficult life circumstances. They are: old age; disability; unemployment; homelessness; partial or complete loss of physical activity, memory; incurable diseases and diseases that require long-term treatment; mental and behavioural disorders; damage caused by fire, natural disaster, catastrophe, hostilities, terrorist act, armed conflict, temporary occupation, etc. [6]. The study of social vulnerability takes into account the following indicators: urbanization, population density,
external migration, the share of women, the elderly, children under 15, people with disabilities, literacy / education level.

The environmental component includes indicators that characterize the impact of hazardous events on the natural environment (flora, fauna, ecosystems, biodiversity), which in turn can increase the vulnerability of a particular area. Urbanization, irresponsible agricultural activities or deforestation are known to increase environmental vulnerability (for example, increase the frequency of floods). For assessing this form of vulnerability the following indicators can be used: the percentage of urbanization, forest cover, forest fires (area affected), groundwater level, percentage of wastelands, landslides, depth of flood waters, etc.

Physical vulnerability determines the possibility, potential of a certain element or system to undergo changes or damage under the influence of natural (floods, landslides or earthquakes) or anthropogenic hazards (mass fires, leakage of harmful substances, accidents at nuclear power plants, etc.). The physical vulnerability of a region depends on its proximity to the source of danger. It is obvious that the region located near the coastline, faults, unstable slopes will be more vulnerable, compared to those that are far from the source of danger. Physical vulnerabilities include difficulties in accessing water, health care, fire brigades, police, communications, poor roads and bridges. Possible indicators here may be: relief, number of hydroelectric power plants, closeness to the source of danger, frequency of floods, average rainfall over the past 50 years. Determining the physical vulnerability of buildings and infrastructure is an important precondition for reducing the risk of disaster.

In addition to these four dimensions of vulnerability, there are also studies researching the fifth element – attitudinal vulnerability. Since the attitude, perception of risk is formed under the influence of cultural, historical and psychological factors, we consider that for this measurement of vulnerability it is more appropriate to use a broader concept, in particular "mental vulnerability". Mental vulnerability includes not only the attitudes of individuals or groups to the world around them and, in particular, to hazards, threats but also the general way of thinking, certain knowledge and skills. Vulnerable communities have lack of diversity, entrepreneurship and the concept of collectivism. This leads to disunity
and individualism in society. Thus, certain beliefs, customs, fatalistic attitudes, lack of information, awareness of one's rights and responsibilities, weak trust in public institutions, and excessive reliance on external support all characterize mentally vulnerable communities. To study this type of vulnerability the following indicators can be used: the level of trust in government agencies, adherence to certain programs and policies to reduce the risk of disasters, the number of calls for help to local authorities in recent times, awareness of the possibility of a disaster, fear of possible disaster, fear of potential destruction of buildings or assets, community cooperation in responding to natural disasters.

The phenomenology of life of the population of any territory forces them to analyse, understand and discuss their weaknesses and needs, as well as strengths and opportunities. This requires a comprehensive assessment of social vulnerability. Such assessment involves the vulnerability factors of exposure, susceptibility and resilience. Exposure means the likelihood of the social system to change, to be damaged under the influence of emergencies, primarily due to its location. Naturally, closeness to a source of danger significantly increases the chances that people or physical objects (property, infrastructure, cultural heritage, agricultural land, etc.) will be negatively affected by this hazard. For example, during a military invasion, residents and settlements bordering the aggressor country suffer first and foremost.

Susceptibility is another factor of social vulnerability. It concerns characteristics of the social system, including the social context, and provides elements that determine the likelihood of being harmed in an emergency. It is about the readiness and awareness of danger by people living in the risk zone, about institutions, that have to reduce the negative effects of danger and the existence of possible measures (for example, evacuation corridors).

In addition to the exposure and susceptibility, the social system also has a certain ability to cope with them, which in mostly studies called as a resilience [5, p. 322]. It includes the ability to positive adaptation, to overcoming and recovering from natural or anthropogenic disasters.

Another important aspect of the study of social vulnerability is its assessment through the lens of division into different levels. For example, in the process of
studying the risks of natural hazards, four levels of vulnerability are distinguished [7, p. 3]: individual within household (relating to personal characteristics); community (characterizes the interaction between people); regional / geographical (distance to services); administrative / institutional (relating to disaster funding and mitigation studies). The last aspect concerns potential losses and reduced capacity for recovery due to critical deficiencies in organizational and institutional mechanisms. Research at this level is important because the inefficiency of various bodies directly or indirectly involved in risk management leads to an increase in the damage caused by natural or man-made disasters.

Based on all above, the framework for assessing social vulnerability was developed (Figure 1).

Fig. 1. **Framework for assessing social vulnerability**

*Source: author’s own elaboration*

Figure 1 shows the vulnerability in its three dimensions of evaluation (components, levels and factors). For a comprehensive assessment of social
vulnerability a matrix of indicators has to be formed. In this case, we can distinguish general (characterize the general vulnerability of the system) and special indicators (characterize the vulnerability of the system to a particular type of danger). The indicators selection should be made for each component of vulnerability (economic, social, environmental, physical and mental) through the prism of factors of disposure, susceptibility and resilience. The content of the matrix of indicators largely depends on the nature of the danger and the level of analysis in the focus of the researcher.

Thus, a comprehensive assessment of social vulnerability is an important basis for decision making and management strategies developing, which improves opportunities to mitigate the negative consequences of disasters and to increase social potential and resilience in the future.

References: