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PERSPECTIVES ON SOCIAL VULNERABILITY AND WAYS TO IMPROVE COMMUNITY RESILIENCE

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Abstract: Scientific recognition of the resilience concept is becoming compelling in extending the way contemporary spatial systems are analysed as well as in defining a new approach in establishing spatial planning principles and policies. In this view, our study emphasises the issue of spatial development in areas prone to earthquakes, floods and landslides. Therefore, resilience requires the assessment of vulnerable spatial components. Local governance interventions are more or less focused on risk management measures. Moreover, building safer communities through risk governance relies on different variables. Making a distinction between risk components and the predictors of increased resilience could shed light on the local decision-making process. In this paper, vulnerability addresses the lack of safety in terms of individual, household and community wellbeing when the issue of environmental restrictions emerge. In order to reduce the vulnerability of communities living in natural risk prone areas, spatial planning often turns to interdisciplinary analysis methods that allow an in-depth perspective on the interplay between social and natural elements. As such, spatial planning stands as the first step in reducing social vulnerability and should approach the less explored advantages of participatory mapping and local knowledge systems.

Risk and vulnerability were defined as highly correlated concepts in natural disaster research and analysis. When discussing the risk concept, we can distinguish two standpoints which aren't opposed by rather interconnected. One describes risk as a result of natural or technological hazards while the other focuses on the social construct and the social perception of risk, this being the perspective of our study as well. From this viewpoint, risk is a concept shaped by all social groups present in a society or community. The approach based on risk perception

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has at heart individual, cultural and social behaviours in regard to risks, thus emphasising not only the individual cognitions but also the role played by social beliefs and values. Another key concept in understanding natural risks is vulnerability. The awareness of being vulnerable and living in a vulnerable environment defines how risk is perceived.

Social vulnerability outlines a set of personal features that include: initial wellbeing, livelihoods and resilience, social and political networks, and institutions. This definition is important since it draws attention to all features of vulnerability which aren't directly linked to the technical and instrumental components of hazards. Instead vulnerability is linked to the assumption that it's just partially determined by the hazard. Downing et al. (2006) defines several dimensions of social vulnerability: a differential exposure to experienced and/or anticipated stress, a dynamic process, a deep rooting into the actions and attributes of social actors, a close link to social, economic, political and environmental networks, a multi-level construction of vulnerability, and an inherent exposure to multi-stresses.

Participatory mapping approach to produce landslides inventories

Collecting landslide data systematically, in a statistic and scientific way, should target the design and implementation of properly planned risk governance measures. Geospatial data on landslides often refers to slope, morphology and location (Malamud et al., 2004). As such, there is a set of classical methods to construct an inventory of landslide prone areas, like geomorphological mapping based on field work, satellite imagery processing, the analysis of surface morphology (Guzzetti et al., 2012).

In fact, geomorphological mapping through field work used to be a fundamental method in gathering data on landslides in Romania. In this case, landslides represent a geomorphological hazard with a high incidence in hilly and mountainous areas in Romania (Micu, 2017). Even though the economic impact resulting from these events is considerable in regard to the impact on community wellbeing, these isn't a comprehensive national geospatial database on the impact of landslides on vulnerable communities, but rather scattered data on measures taken to prevent landslide occurrence and to organise emergency interventions.

An additional mapping issue is represented by the case of historical landslides that are most often completely of partially covered by vegetation or where reshaped by erosion or human interventions like agriculture and constructions. A conventional approach to geospatial databases uses satellite imagery without exploring local knowledge. Yet landslides occurring on abandoned open fields that are further invaded by forest vegetation are difficult to analyse based on the

spectral signature of satellite images that would normally allow to identify geomorphological features (Weirich and Blesius, 2007).

In this context, the need to identify areas exposed to landslides could turn to the local knowledge systems which are recognised to be produced through permanent social interactions between communities and their living environment, which could become instrumental in assessing natural risks and therefore linking research and planning more efficiently (Lawrence, 2010).

Furthermore, international studies exploring the attitudes of social actors towards measures to reduce the impact of natural risks have concluded that a partnership between communities and decision-makers could represent a solution to achieve the sustainable development of such territories (Cheung et al., 2016) when a genuine sense of involvement is produced and when the value of local knowledge is recognised by governing structures. Otherwise, it was emphasised that despite perceiving the existence of an eminent risk on the individual and community wellbeing, people continue to live in areas prone to natural risks (Sudmeier-Rieux et al., 2012).

Based on this empirical evidence, it comes out that participatory planning of landslides could become a complementary method through which local communities can gain a better access to understanding their environment and experience of landslides. This integration allows researchers and decision-makers to identify sites that were affected by past landslides and thus improving databases with information of community cognitions. This method was used in the study of Samodra et al. (2015) and Anderson et al. (2011) and turned out to be an effective starting point in designing proper prevention and intervention measures in the case of vulnerable communities.

Participatory planning can be associated with the particular field of urban planning that used participation to facilitate the implementation of public policies. The hypothesis is that public participation enables people to develop realistic expectations and reduces resistance to change in urban planning by putting their local knowledge into the use of urban development (Murray, 2010). This particular model includes a linear approach of survey, planning interventions and action which strongly influenced the ecological perspective on planning through a higher consideration of the growing need for a social and environmental approach that could assist planners in finding suitable solutions (Komendantov et al., 2014).

Information campaigns on protection in case of an earthquake

The risk is a constant of human life, which seems to be determined not only by external conditions (external risks), but also by the decision-making processes (Bauman, 2000, apud Lucini, 2014). Risk perception becomes a social component to be considered due to its importance in shaping the mental image of risk and the

practical implications for preventive and planning activities. Therefore, the risk is not only a social process, but also part of a communication process (Lucina, 2014).

According to the risk mapps, almost the entire country territory is highly seismic. 50% of the exposed areas are influenced by Vrancea earthquakes, while 15% are exposed to crustal (surface) earthquakes. The statistical data on the distribution of population by seismic zones shows that 35% of the total population, also representing 66% of total urban population, is exposed to Vrancea earthquakes (Georgescu et al., 2012). These statistics constitute a solid argument to improve protection measures and to reduce population vulnerability in case of an earthquake. In addition, due to the large period of time between high magnitude earthquakes there is a low awareness of seismic risk that can lead to major negligence in the design and construction of buildings, as well as a lack of adequate education regarding earthquakes.

Given that preventing and preparing communities to cope with disasters is more effective, cheaper and more sustainable than reconstruction efforts, there are several possible solutions which should be considered: communication and informing the public about the earthquake protection regulations; building the institutional capacity to manage earthquake risk through an integrated response at all levels of decision and action; strengthening the enforcement of norms and rules in the design and execution of constructions. In the following we will focus on measures to inform the population, which can contribute to developing a popular culture of safety. The literature describes four approaches that can be used to inform the public about earthquakes: information campaigns, participatory learning, informal education and formal interventions in schools (IFRC, 2011). Communication and information initiatives can be implemented any time before and after an earthquake happens.

In general, the objectives of information campaigns aim to increase the awareness and the level of understanding regarding seismic risks, to inform people about the authorities empowered to manage crises, to prepare for better response and to ensure personal safety during and after an earthquake. When establishing the communication objectives, the following premises may be considered:

- population's knowledge and level of information about earthquakes;
- public participation in civil society structures;
- degree of passivity and lack of civic involvement in prevention actions.

In this regard, a study conducted by Mercury Promotions in 2007 shows that awareness related to seismic issues is relatively high spread within the Romanian population. Although there is general knowledge regarding proper attitudes, behaviours and measures to be taken before, during and after an earthquake, this knowledge is rather insufficient, and poorly applied. Public participation in civic and volunteer's organizations is relatively small, and this inertia is doubled by the

mentality that state authorities are the only ones that should intervene and minimize the effects. In the above mentioned study, the degree of passivity is explained by the fact that the population does not feel threatened by an imminent disaster / earthquake.

Information campaigns involve: actions targeting the adult population / families (development of promotional / informative / educational materials, websites, documentary, call centres, distribution of informational and educational materials, integrated media campaign, PR campaign, partnerships among various institutions); activities for mass media (media briefings, press conferences, media seminars, media partnerships, leaflets, identification of possible topics to be covered by the press, newsletters); activities for institutions and organizations (developing advertising materials, dissemination, websites, partnerships for conferences and seminars, other events) and activities for children (promotional / informative / educational materials, web section for children) (Mercury Promotions, 2007). Also, information campaign activities may include: publications, e-learning, games and competitions, podcasts, social media and telecommunications (IFRC, 2011).

In case of emergency, the principles of communication aim the following (ISU Olt, 2009):

- timely transmission to the public and to media representatives of the proper information for an effective management of consequences;
- complete provision of answers to media representatives or other audiences, as the information transmitted are confirmed;
- 'one voice' principle - to ensure message consistency at all levels involved in the communication campaign as a whole.

Good practices of communication during an emergency and / or an earthquake help both the responsible authorities and the affected population and help to prevent the spread of misinformation and rumours. Compliance with the established rules will also prevent the occurrence of confusion, which is unavoidable when various public institutions disseminate in a disorganized manner information about the same event.

Since 2008, Romania has adopted a National Strategy for Communication and Public Information for Emergencies (Government of Romania, GD 548/2008). This is part of the measures needed to launch a national campaign to educate and to inform the public regarding emergencies, which targets both local authorities and urban and rural communities. The objectives set in the strategy aim to: improve the capacity of public authorities to communicate with the public and the media during an emergency; establish rules and procedures for all public authorities involved in emergency as well as to provide the framework for the development of partnerships

and securing the necessary resources for effective communication during an emergency.

Flood risk perception and practices of local communities in applying protective measures in case of floods

The consequences of floods in the last ten years in our country have increased social responsibility and prompted a new approach of managing flood risk. In this approach, the awareness and involvement of human communities have a crucial role in avoiding loss of life and reducing damages. Today it is largely explored in order to face future challenges by introducing new concepts such as „more space for rivers" or „living with floods" and especially by assimilating the concept of sustainable development in flood risk management (Guvernul României, 2010).

Studies carried out after disasters have highlighted that cultural differences exist in how people relate to risks derived from a blend of beliefs, values, customs, knowledge, social structure (Armaș, 2008). From cultural perspective, in relation to events that involve a natural hazard, it seems that it has an essential role of locus of control, risks being responsible for various levels of anxiety and post-traumatic stress (Joseph et al., 1993). In some cultures with strictly pyramidal structure, such as Indian or Japanese cultures, people tend to assign the control of their lives to external factors (Triandis, 1996; Giddens, 1999). This system of beliefs that characterizes the traditionalist cultures is responsible for posttraumatic shock intensity due to the fact that those with locus of external control suffer stress more acutely than those characterized by strongly felt internal locus of control (Freedy et al., 1994; Armaș, 2012). The orientation towards an internal or external locus of control and cognitive processes influence the type of behaviour adopted in disaster response (Joseph et al., 1993; Meichenbaum, 1995). Thus people with external orientation, fatalistic, also present an additional risk factor in a crisis because they are prone to an inhibition of actively behaviour or in seeking a solution (Wheaton, 1982).

In communities affected by social and rapid technological changes it's becoming more difficult to adapt to a changing environment due of disorganization and lack of awareness about the possible consequences that amplify environmental issues (Bovens, 1998; Harmsworth and Raynor 2004).

In these circumstances, there is a need for governmental policies to develop educational programs in order to raise awareness on environmental issues, but these programs should be based on studies on risk perception in the most vulnerable community taking into consideration the type of risk they are exposed to develop effective customized solutions, thus increasing the resilience of that community. Furthermore the concept of sustainable development and of sustainable flood protection is interlinked, i.e. the inclusion of flood risk

management in a wider frame, well known, and the concept of water integrated management at river basin level.

In a comprehensive management approach, the National Strategy of flood risks on a medium and long run summarises the aims of European Directive 2007/60/EC, and emphasizes the social objectives of the risk management emphasising the role of information, consultation and public participation in drafting the management plan for flood prone areas, and the related action plan.

Spatial planning is seen as an increasingly important tool in reducing the consequences of floods. However, there are few studies that show why local authorities have a low interaction with spatial planning tools that might prevent flood risks. Neuvel and van den Brink conducted a study that stressed the relationship between spatial plans and flood risk management, highlighting strategies to reduce flooding in local planning practices in the Netherlands. This study indicates that many settlements are located in floodplains near rivers or the seaside (Van den Brink and Neuvel, 2009). The study was conducted in 10 cities in the western Netherlands showed that local authorities believe that waters managing institutions and stokeholds are directly responsible for flood risk managing. To protect these settlements, dikes were built in order to reduce the likelihood of flooding. However, urban expansion combined with the expected effects of climate change have increased the likelihood and potential impact of flooding even in areas protected by dikes. In this context, spatial planning is considered an important tool in reducing the impact of flooding. Recent experience in areas affected by floods brings an important argument to use spatial planning to reduce flood risks (Roth and Warner, 2007). Local authorities have argued that past experiences motivated them into considering land use strategies to minimize the risk consequences by reducing exposure to flooding or by improving coping capacity (responsiveness).

Regulations concerning the land use can restrict the expansion of built-up areas into vulnerable areas or can set specific elevation thresholds that could guarantee the safety of residential buildings. Despite recognizing the intrinsic relationship between spatial planning and flood risk management, many studies have revealed that local authorities do not implement measures to mitigate flooding throughout the spatial planning process (Burby, 1998; Hooijer et al. 2004).

As part of the existing practices in urban development policies, strategies on how to use the land to reduce flood risks have been addressed far too minimal. In the proximity of dams, built-up restrictions were enacted in order to enable a safety space required by future needs of flooding reinforcements. In the case of foothill areas that weren't protected by dikes, some land use changes also occurred such as river widening measures implemented through local urban plans (May and Deyle, 1998). These measures can be characterized as being focused on reducing the likelihood of flooding. The measures affecting a catchment area increasingly rely

on green infrastructure solutions such as reforestation, hill terracing with orchards or vineyards, as well as perpendicular agricultural interventions on slopes.

Conclusion

Usually, a low participation of the population to the activity of risk management institutions is doubled by the preconception that public authorities are the only ones that should take action in the effort of mitigating the effects of natural disasters. It is necessary to undertake a complex educational and information campaign with the population living in various areas affected by hazards, being extremely important to influence the way people will react in case of a disaster. In Romania, there's a low interest in enabling the access of civil society to forms of organisation pursuing the mitigation of risks, this inertia being explained by the perception on risks, especially seismic ones, as highly improbable to affect their current wellbeing. In terms of spatial planning, the lack of updated micro level data seems to be the main obstacle in assessing the spatial components exposed to risks.

This study also intended to emphasise the importance of participatory mapping as a preliminary step in designing policies and measures to prevent and mitigate the impact of natural disasters. We explained the role of local communities as early as identifying risk prone areas, thus highlighting the importance of education and knowledge transfer in this field. The international studies reviewed in this study pinpoint the participatory mapping method as a solution to improve geospatial databases and to bring more meaning to the governing instruments for risk protection.

In addition to the various interests of local decision-makers, we observed that other factors, such as individual power could also influence the outcome of the planning process (Hajer and Laws, 2006). For this reason, actors responsible for the implementation water management policies can change existing practices, having the power to attract attention to the problems of flood risk mitigation measures. Such responsibility in the upper levels of territorial government could actively coordinate the reconsideration of flood risk management in spatial planning practices because local authorities are known to be more involved when central authorities specifically asked them to do this (Olshansky and Kartez, 1998). Water administration authorities also have an important task in helping local governments in the sense that they should provide specialized information on flood prone areas.

Risk perception and definition determine the vulnerability and resilience of a community during an emergency. Therefore, vulnerability can be amplified or diminished by the risk perception and determine also the opportunities that people

have to cope with a disaster. In this context, from a practical perspective it becomes important how risk perception at individual and community level can be influenced, especially through communication and / or communication campaigns. Information transmitted through public campaigns have an important role in what might be called the formation of a "culture of safety", but also in how people react in case of an earthquake. Thus, to be effective, information campaigns must be organized so that, depending on the target audience, the best course of action and activities could be selected.

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