

SOCIAL VULNERABILITY AND RESILIENCE AS SOCIAL AND CULTURAL FACTORS IN HUMAN RESPONSE TO NATURAL DISASTERS. CASE STUDY - THE REACTION TO THE FLOODS PRODUCED ON THE FIȘAG RIVER.

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Abstract. Social vulnerability and resilience as social and cultural factors in human response to natural disasters. Case study - the reaction to the floods produced on the Fișag River. Social vulnerability and resilience as cultural components of society are already established terms in international and national literature in researching the reaction of individuals and communities to natural hazards. The need to define these components is in the process of scientific debate, and there is already a paradigmatic framework in the field of disaster research. The sociological complexity of the human relations with the natural hazards phenomena, give rise to new approaches and definitions of the process; there is still the retention in the outline of some dimensions of the social relations towards the disasters suitable for measuring, scaling or observing and defining some laws or patterns, before, during or after the consumption of the impact phenomena in the anthroposphere. The instrumentalization from a cultural point of view of a scientific research with the help of these concepts, was achieved through the historical and current study of the reaction of the communities in the localities located on the Fișag stream in Ciuc Depression.

Key words: vulnerability, resilience, perception, floods, Fișag

1. INTRODUCTION

The Fișag stream is a tributary to the right of the Olt River and crosses several localities (Armășeni, Armășenii Noi, Ciucsângeorgiu, and downstream of the Bancu locality it enters the lower part of the Ciuc Depression and flows into the Olto River near the Cetățuia locality (Fig. 1).

The localities within the Fișag River basin are frequently flooded, due to the heavy rainfall falling within the investigated area (800-900 mm/year) and the torrential characteristics of the tributaries from the Ciuc Mountains (Toplita and the Sfânta Biserică - Szentegyhaza streams).

Three localities along the Fișag stream are not on the main communication path of its depression and thus the time distance indicator can give a significant picture regarding the flood compartment.

The localities included in the Fișag river basin belong to the rural environment and according to the 2011 census they have a population of 7161 inhabitants. Greater are the two commune centers Ciuc, Sângeorgiu (4839 inhabitants), and Sânmartin (2231 inhabitants together with Ciucani).

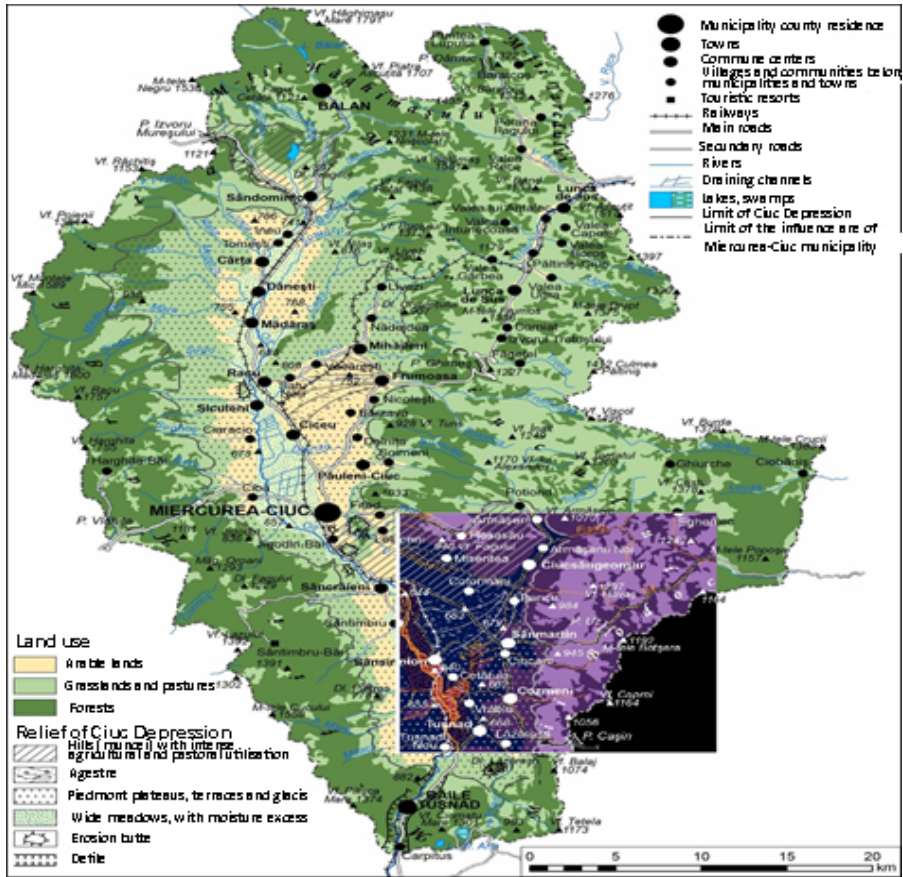


Fig. 1. Location of the study area

As a population evolution, started in 1989, with the change of the political social regime, both administrative centers experienced population declines but not with a high average (from 2443 to 2231 - Sânmartin (9.3% decrease), and Ciucșângeorgiu from 5061 to 4839 (4.4% decrease)(www.insse.ro TEMPO Data Base, National Institute for Statistics).

In terms of migration, while Sânmartin, which is on the main road of the Ciuc Depression, had a positive migratory balance with an average of 41 inhabitants per year between 1990 and 2006, Ciucșângeorgiu suffered a negative migratory balance with an average of 87 inhabitants per year in the same period.

Regarding the age structure, the age pyramids at the level of the two administrative centers show an unbalanced structure with discontinuities at the level of 35 and 50 years respectively, which denounces that at the level of these generations the share of emigrants was higher.

The notion of vulnerability as a characteristic of the socio-human system is described as having a reduced structural capacity, in the face of chance, especially the natural one, being constituted by a complex of factors, which interact dynamically.

Due to the dynamic and multifactorial character of the social vulnerability, there are still difficulties in quantifying this dimension of social construction. Within the scientific effort to outline the concept of social vulnerability, it is necessary to take into account the perception of each social part involved, in order to understand the "social construction of risk". Some authors consider that the perception of the geographical environment also contains the perception before the hazards (Sorocovschi and Mac 2004). To define it, three paradigms are used: axiomatic measurement, socio-cultural and, respectively, psychometric constructions, as a basis for anticipating the answers of individuals or community in the process of adaptation, overcoming of disasters. Thus, "the perception can be analytical - focused on certain objects, respectively general - integrative" (Sorocovschi, Mac, 2004). At the individual level, perception as a fundamental element of cognitive constructs is important for generating an adaptive attitude as functional as possible, hence the possibility of a scientific and predictable interpretation, in the sense of adaptation, with the three components of the attitude: cognitive, affective and behavioral.

According to the European directives, in Romania, the measurement of perception in the face of disasters, especially of floods, is defined as a general objective for integrating this factor in the preparation of the institutional response for the management of natural hazards. Based on studies on the hazards perception, Sorocovschi and Mac found a series of variables with cognitive-attitudinal significance in human manifestations regarding risk.

In this sense, the interdependence of the behavior is emphasized, having as an indicator the "intensity of perception" with respect to the time-distance variable, thus mentioning that the intensity of perception diminishes in time and space. Hence the need to optimize communication both educationally and during the pre-hazard period.

The term resilience is already long established in the studies in the field of natural phenomena research; it has been developed by various schools of ecological (Dumitrașcu Veronica 2017 after Holling, 1973), psychological (Bonano, 2006), social-ecological (Berkes, 2003) thinking, being defined by cultural perspective, as well as the ability of a system to reorganize itself against adverse events through processes of overcoming and memory (Birkmann, Joe et al. 2013).

At the society level, the concept is considered to be part of the "vulnerability paradigm" which "seeks to understand how social, economic and political relationships influence and highlight the importance of context, time, place and how people live" (Dumitraşcu, 2017, after Thomas et al., 2013). Therefore, vulnerability and resilience are the components that need to be included in the outline of the broad framework of individual and community events before, during and after the manifestation of disasters.

The risk perception (obviously as a psychological-social factor) can diminish or increase the degree of risk. In schematic terms, after Alexander (2012), this can be viewed through the relation:

$$\textit{Total disaster vulnerability} = \textit{risk amplification processes} - \textit{risk mitigation processes} \pm \textit{risk perception factors}$$

According to the same author, in the processes of disaster risk reduction (education, communication, preparatory activities, etc.), there is a complex interaction between perception and culture. The culture seen as a frame of cognitive and behavioral manifestation at the community level is difficult to quantify. This is why it is mentioned that the studies on culture are quite few so far (David Alexander, 2012, after Gheradi 1980), however, a first definition can be expressed respectively, as "an assembly of opinions, shared beliefs, social characteristics and attitudes".

I believe that from this perspective the theoretical foundations of the law of "sociological parallelism" by Dimitrie Gusti, regarding the social-cultural frameworks in which the life of a community manifests, can give a perspective on the individual and community behaviors in the context of a risk phenomenon. Also at the individual level, "each of us is the heir to a cultural foundation, whereby we are more or less connected to certain places or social groups with stronger or weaker relationships. Throughout our lives we accumulate cultural characteristics through learning and assimilation. From this angle, culture is a dynamic process but whose specific components manifest themselves in a particular cultural context.

The importance of knowing the vulnerabilities, especially of the social ones, is important because "disaster reduction measures should be based on a continuous assessment of vulnerabilities, ensuring a comprehensive understanding of disaster risks". In this regard, special attention must be paid to identifying the geographical and structural demographic areas that are at risk because "an aging community, with a high migration and where very few people are born, is in itself a vulnerable community, which can hardly cope with disasters of any kind". (Dumitraşcu, 2017). Several authors point out that the scientific

approach needed to identify and outline social vulnerabilities should be done "with the communities" and not for them.

2. USED DATA AND METHODS

In accordance with the scientific research concepts and frameworks presented in the introduction, we interpreted historical data to evaluate inherited norms and customs, interpreting aspects of social manifestation in the context of hazard manifestations.

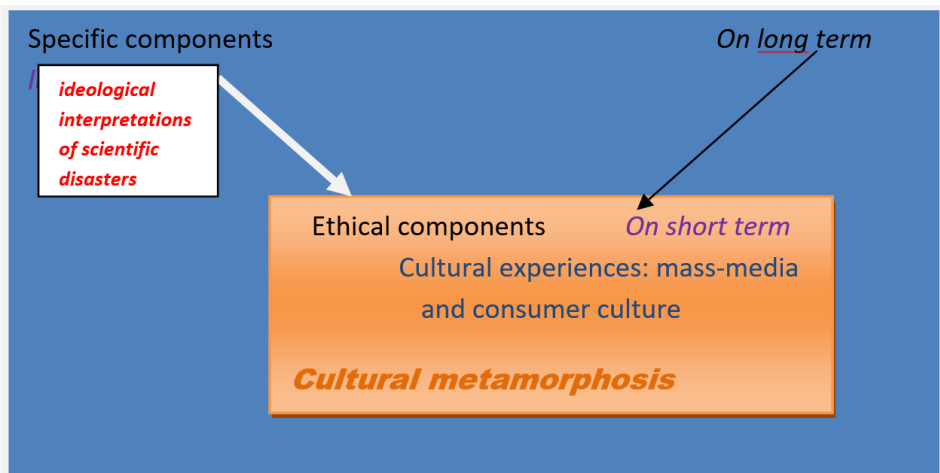


Fig. 2. Frameworks for cultural manifestation of chance (after David Alexander, 2012)

The orientations and values, as well as the behavioral aspects in the context of the hazards, especially those of the summer of 2019, were detected from the reports of the local publications on the INTERNET, in the context of the phenomena presented during the floods. For the cultural aspects we used the conceptual schema used by David Alexander, (2012) whose translation we present below, of which we used only certain components (Fig. 2)

To highlight the mass culture and its manifestation during the floods of June 2019 in the case of the localities on the Fişag stream, we used the Google trends program without absolute but only comparative values, to highlight the orientation on values that are activated in the context of chance by accessing topics after the word flood, without being able to make reference to the geographical area delimited within the study.

3. RESULTS AND DISCUSSIONS

In order to visualize specific behaviors at individual and community level, in conditions of risk or confrontation of natural hazards, especially for the calamities caused by floods, we have delimited a geographical area from the Olt basin of the Ciuc Depression, that of the localities on the Fișag stream from the following reasons:

- The area is permanently subjected to floods caused by the overflow of the Fișag stream, having as cause the abundant rains during summer and autumn and the torrential character of the tributaries descending from Ciuc Mountains. These events have been described since 1703 and are recorded in the first Fiscal Conscription of Transylvania prepared by the Austrians.

- Over time the communities of the localities have adopted and transmitted customs regarding the risk behavior, especially for the floods.

- The works of water course planning in the Fișag stream began as early as the 19th century, the historical documents highlighting ways of manifestation at community level, for the prevention of accidents.

- At present, the localities in the Fișag stream basin continue to be affected by floods, under the same climatic and relief conditions, but the population of the localities is aging, with fertility and birth rate decreasing.

- The latest water events have highlighted specific attitudes and behaviors of the population through the perspective of the new cultural research frameworks.

The main climatic events that led to flooding in the studied area were torrential rains, with large amounts in short periods of time (100-150 mm), especially during summer - June or August. (after „The Geography of Romania”, 1983, p. 240).

In a geographical monograph with social elements, (*Vitos Mozes Csiki Fuzetek*, Editura Gyorgyjakab Marton, Miercurea Ciuc, electronic version 1894). mentions that following the rains during 28-29 of August 1889 and due to the dragged material entailed, 42 houses and annexes were demolished in the localities of Ciucsângeorgiu and Bancu following the flood, for which it was necessary to carry out joint works in order to diminish the floods damages caused especially on the Fișag stream, which when inflated flows at an increased speed.

The weekly publication *Csiki Lapok* from September 4, 1889, mentions that the stream's water reached as far as 100 meters from the normal river bed and has demolished all the houses on its edge, causing significant damage due to the destruction of the crops, which were already stored in the barns. It is mentioned that the flood came unexpectedly, with great speed and volume, after the flooding the image being very bleak.

In this sense, the same publication from March 3, 1913, reminds of the sub-prefect's decree from 1885 saying that the Sânmartin commune must do the

annual spring cleaning of the Fișag river bed (the course being already in the meadow area) "which floods every year". The cleaning work will be carried out under the coordination of the engineering office located in Brasov.

It is worth mentioning that at present, only the river is regulated by the construction of a 9 km long earth dam. Also, in order to diminish the possibility of flooding the Fisag floodplain, by the torrents flowing from the river slopes in the area of Sânmartin, water drainage channels have been created (Fig. 3).



Fig. 3. Agricultural constructions for the prevention of rainfall on the slopes and the protection of the road near Fișag stream.

On June 18, 2019, as a result of the falling rains that exceeded 30 l/m², the streams Sânmartin, Uz from Sânmărtin, and Szentegyhaza (Sfânta Biserică) from Bancu exceeded their river beds, resulting in land flooding, which on a portion of 1,5 km flooded the connecting road between the two localities. Also on Szentegyhaza Street, where the tributary of Fișag stream flows, the road was flooded on a 700-meter section.

As a result of this event, the locals and the civilian fire teams, as well as those from ISU, evacuated the water and the mud from the affected households. It is mentioned that following the floods, the inhabitants of Sânmartin were helped by their relatives from the neighboring localities.

An unusual fact must be mentioned the way of naming the streets in the mentioned localities and those from Ciucul de Jos, south of the city of Miercurea Ciuc. Thus, in the mentioned localities, the streets bear the name of families or their relatives, such as Galilor Street, Pallii Street, etc. It is a way to claim a kinship heritage from the predominantly agricultural societies, with an archaic way of life. According to some customs, later becoming local rights, the sons

built their houses on the parents' land and thus the agricultural work could be carried out jointly. Here, the significance and the inherited value has transformed into a symbolic one of the extended family, which has been transformed and manifested by a specific behavior at random.

For the purpose of a comprehensive psychological research with projections at community level, I consider it necessary from the methodological perspective to use a set of unstructured interviews.

To evaluate the impact of mass culture and media, respectively the interest or needs of the population in the context of the floods of June 2019, the word "arviz" - flood in Hungarian - was introduced through the google-train program. The results were important in the area of Harghita County, with the maximum number of hits during the end of June. As related topics, that is, those who accessed the word arviz, they also accessed the word insurance, this topic appearing as a hierarchy on the 9th place. Particularizing on the Harghita region, the maximum interest is also the period from the end of June.

4. CONCLUSIONS.

The current theoretical and methodological research highlights the need to study human behavior in disasters, through quantifiable-measurable variables, in which risk perception is the main one. The research also revealed other indicators of importance, distance and time to the place of the accident event.

An alleged pro-adaptive behavior can be outlined by describing and inventorying the cultural values inherited, assimilated and manifested at community level.

The cultural approach involves identifying the multiple manifestation facets that manifest themselves in specific psychological and sociological frameworks in

The researches with cultural significance at random are not yet sufficiently explored to realize a projection of individual pro-adaptive behaviors or with manifestation at community level within the given disaster, precursor, during and after random events.

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