PUBLIC PERCEPTION OF FLOOD RISKS IN THE TAZLĂU-CAŞIN BASIN

ELENA IGNAT

ABSTRACT. – Public perception of flood risks in the Tazlău-Caşin Basin. This paper analyses the results of a public survey, which was conducted from July 2008 untill January 2009 with participants that live in the lower part of Trotuş river basin (the Tazlău-Caşin depression), both in urban and rural areas . In the survey 150 people answered to questions related to age, sex, occupation, education, the concept of flooding, their oppinion on the way authorities deal with the risk of flooding, the willingness to volunteer in risk mitigation, personal experience with flooding, etc. A similar questionnaire, based on scientific information on the concept of flooding, was answered by a group of pupils (119), aged 8 to 18 years, from the same area. The main goal of this particulaire survey was to identify the way that youngsters perceive and understand floods as an important natural hazard in the area, in order to come up with better methods to inform, educate and train people about floods and proper reactions during flood events.

Key words: flood risk, public survey, Trotuş river basin.

1. Introduction

Floods are considered to be the most studied natural disasters. Nowadays technologies have tremendously increased the possibilities of weather and hydrological forecasts, yet the number of flood victims is still high, mainly due to the lack of knowledge and inadequate behavior of the people involved in a flood event. Public surveys are thus needed because the inhabitants of flood exposed areas are the most important actors in risk management, allong with the local, provincial and national authorities; the questions they answer reveal important behavioral features, which should be used in establishing the proper measures in risk mitigation. It is certified that the inadequate response that people have when floods occur comes from little or no understanding of all the implications of this kind of risks.

In the lower part of Trotuş river basin, the flood risk management is at its begginings, so the public perception of flood risks is still a blury issue.The survey that was conducted from July 2008 to January 2009 is meant as a starting point to a more thorough and accurate study of this matter.

The medium and lower part of Trotuş river basin was recently affected by floods (2005), which occured both on the main stream (Trotuş) and on its tributaries (Caşin, Oituz, Tazlău), mainly caused by heavy rainfall combined with agressive environment transformation, such as massive deforestation in the upper basin of Trotuş. The study is not connected to any concrete flood, but appraises the general perception of floods and related events (e.g. warnings, mitigation measures).

The questionnaire used to study the public perception of flood risk represents a form of quantitative research that applies the method of verbally expressed preferences – this allows lay people to indicate their oppinion on various subjects regarding flood risk management or how they would act when flood events occur. It is based on the survey conducted in the Cluj and Dej Hills (V. Sorocovschi, 2004) and it has an „identification tag" (regarding the location of the household, age, sex, level of education) and 19 questions that explore the degree of knowledge, experience and information (1-6), the reaction to a flooding event and willingness to taking mitigation measures (7-11, 16), the level of insurance and reimbursement (12, 17), the perception of public authorities risk management strategies (13-15) and the level of concern related to flood risks in the region (18-19).

School children in the same area were also asked to answer a questionnaire regarding their level of knowledge on floods and flood risks; they are the future citizens and by early educating them in this matter it should be possible to increase the public participation in mitigation measures and flood defence strategies. The results of this second survey are briefly described only in order to point out the main weak points in pupils perception on floods and their connection to the general attitude towards floods of the adult inhabitants of this area.

2. Participants

The identification data of all the participants in the survey is important because the personal characteristics of every individual are one of the three groups of factors that influence the perceived risk, combined with the situational factors and risk characteristics (Whyte, 1986, quoted by M. Brilly and M. Polic, 2005).

62,6% of the participants live in urban areas (89% of them are residents in Oneşti, the others are from Tg. Ocna and Adjud) and the rest of 37,4% in rural areas surrounding these towns, such as Tg. Trotuş (25% of them), Căiuți, Berzunți, Oituz, Coțofăneşti (39,2%), Buciumi, Urecheşti, Caşin. For the rural inhabitants, the household location reveals great importance for the perception of risks – 33,9% of the participants live in the floodplain, 55,3% of them on different levels of terraces and 10,8% on the mountainside.

Age is another personal characteristic which is of utmost importance for the flood risk perception, not only because of the general view over life that a

person of a certain age has, but also by the level of experience with floods of that person (older people have at least the possibility to witness more flooding events). From all the participants, the most prevailing age average is 31 to 40 years (46%), followed by 41 – 50 years (26%). Persons under 30 and persons of 51 to 60 years old are relatively close as percentage (12,6% and 10,6% the latter), while only 4,8% of the participants are over 61 years old. The gender structure reveals a higher percentage of females (63,3%) and a lower one for males (36,7%).

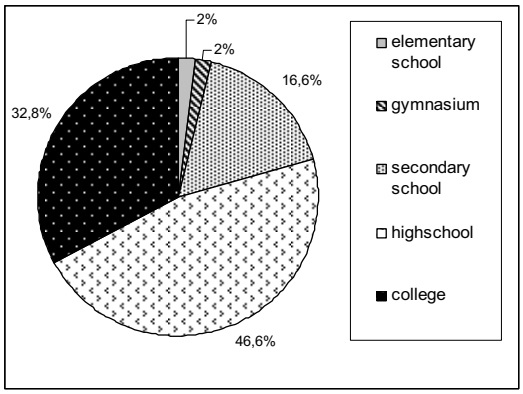

Fig. 1. The educational level of the participants

The educational level also influences the attitude and the behavior of people in case of flooding; 46,6% of the participants have a highschool degree, 32,8% - higher education (college degree), 16,6% - secondary school and 4% only gymnasium degree (fig.1.).

This situation (regarding age, gender and education) will later reflect in the analysis of the answers.

3. Results of the survey

a)the degree of knowledge, experience and information

Despite the fact that the area subjected to the survey has been several times affected by floods, 30,6% of the participants have declared that neither them nor the place they live in have been affected, probably because of the meaning they assign to this term – perceiving it more seriously. 38% responded that the area was affected by floods, but themselves weren't, 22% experienced floods but did not suffer any losses and 9,4% have suffered material damages from the floods they were in (85% of the latter come from rural areas and their household is located closer than 500 m to the river, in the floodplain). None of the participants have experienced casualties (deaths or injuries) during the floods.

As for the number of events they witnessed, most of the participants have had difficulties in recalling the date of the floods. The most frequent declared months were May, June and July of the years 1991 and 2005, but also 2002, 2006, 2007. The persons that had no material losses come in great number from the urban areas (Oneşti, Tg. Ocna) and consider that they were indirectly affected by the lack of drinking water and the cut off of gas and electricity.

When asked in what extent they use to watch the weather and hydrological forecasts, 52,6% of the participants declared they regularly watch it, 43,3% do this occasionally and just 4,1% rarely; none of the participants never watches the forecasts. The differences caused by the gender of the participants are not very striking, as 67% of those who rarely consult floods forecasts are females. The degree of previous experience with floods is important, 64,8% of participants who regularly follow the forecasts have had experienced damages during the floods.

As for the main source of information, national television is by far the most frequent followed media (80%); radio, internet and newspapers gathered close percentages of about 6% when asked about the most often watched source of flood forecasts. The media which is the least consulted are newspapers (16% never read the newspapers weather section), compared to 8,6% that never check the weather on the internet. This is probably due to the fact that 57% of the participants live in urban areas where the internet services are well implemented but also because the written media has a certain degree of delay in warning about potentially dangerous events. Little discrepancies were recorded as far as the dwelling area is concern for the variety of information sources: national television is the most reliable source for both urban and rural areas, but all the 5,3% that stated they most oftenly follow the forecasts on the internet and the radio are town citizens. The credibility of the forecasts is relatively high: 12,6% consider the prognoses to be very accurate, 67,3% - often accurate and only 20,1% - seldom precise. None of the participants considered the weather and hydrological forecasts as never accurate.

The perception of the various causes that generate floods in the area is very important for the prevention and mitigation activity against this natural hazard; thus, 59,3% of the participants have corectly identified the heavy rainfall as the most frequent cause of the floods, as well as the massive deforestation upstream (37,3%). Only 8% stated they don't know what caused the floods, all of them from those who were never affected by floods. For other causes, participants mentioned the breaking of Belci dam, which produced important damages in July 1991, as well as the poor maintenance of the water course, the lack of river banks consolidation and even the global warming.

b)the public reaction to a flooding event and willingness to taking mitigation measures

The previous results of the survey strongly reflect the prevailing age cathegory (30 to 50 years) of the participants, but also their relatively high education level; it's an active population, willing and eager to know more about the subject of floods. This is why 56% consider they just partially know how to react in case of a flood, 12,6% don't know this and 31,3% state they know how to respond in this case. We should take into consideration that not even those who have previously been affected by floods know better how to react, as 57% of them stated they want to learn more about this matter. People's reaction is, however, strongly influenced by stressful conditions and imminent danger.

As far as the activities after hearing about the threat of flood are concern, the average rank order shows that the top priority is putting family to safety – 69,3%, calling the 112 emergency number – 14,6% and turning off electricity or gas – 8,1% ; the second and third place reveal similarities for the preparation of food and water supplies, calling 112 and disconnecting home appliances, followed by putting valuables to safety and protecting domestic animals. The last 3 places in this hierarchy are occupied by putting the car in a safe place, fleding home or consulting with neighbours and relatives.

When asked if they would leave their homes in case of a flood, 28% of the participants answered they would leave without beeing told, 55,8% of them would follow the routes reccomended by authorities, 10,2% would only leave if forced and only 6% would not leave the premises. The latter have ages from 40 to 64 years and motivate their choice as follows: they want to help others during the floods, they want the authorities to be completely sure about the potential danger before they do anything and they just don't want to walk away from everything they've worked for all their lifes. The participants in the survey are thus very much willing to take action if a flood should occur, as stated by the results of the following question – asked if they would personally contribute to their rescue, only 10% of them rely on the intervention of authorities, while 90% agreed they would personally contribute.

The willingness to participate in volunteer actions is also high, as 76,1% are willing to help building dams, cleaning the riverbed or collecting and distributing supplies and only 25,9% don't want to take such actions (25% of the male participants and 23% of all the females), some of them explaining their choice by their age or their lack of physical strenght.

Subjects were also asked what other counter-measures against floods they would agree to take; in this matter, 42% of them indicated they strongly feel they should buy insurance against floods for their home, and 26% are more comitted to volunteer actions. Measures that need economic participation are less approved of, thus only 15,3% would very much agree to pay additional taxes to the local budget for mitigation measures (such as consolidating riverbanks or implementing warning systems), 29,3% are less likely to do this and 11,3% don't even consider taking such action. Reading and improving their knowledge on floods is also a non-structural measure that 35,3% of the participants would choose (16% just seldom and 7,3% not at all), while moving to a safer area isn't considered a very viable sollution, as 14% of the participants won't even take it into consideration.

c)the level of insurance and reimbursement

Despite the results shown above, the per-centage of people who actually ha- insurance against floods is of only 22,6% (compared to the 42% that would buy insu-rance as a mit-tion measure). Among them, 38,2% dwell in rural areas and 61,8% in urban regions, 47% have college education (faculty degree) and 67,6% are women.

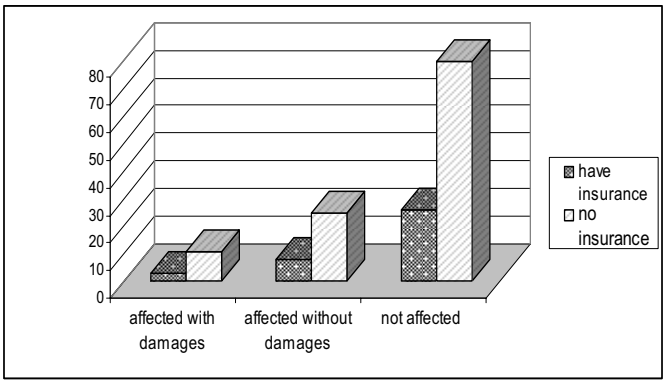

Fig. 2. Insurance policies compaison in terms of the damage

Because contracting an insurance policy is strongly related to the previous experience with risks (allong with risk exposure, finances, education, age, etc.), we find somehow surprising the fact that only 21,4% of the participants who had experienced damages from floods in the past have insurance today, while those who were never affected by floods could have been less interested in this aspect (yet, 21,7% of them own an insurance policy). This shows that people's perception on flood risks is correct, they see them as threats and even take action against them.

As for the help received after the floods, all those who initially declared that they were never affected (68,6%) also stated they didn't need to be helped, and from all those who suffered various degrees of damage from floods 19,1% weren't helped even if they had experienced damages, 68,1% didn't need to be helped and 12,8% received help – the main reimbursement sources were friends and relatives first, the state and local comunity second (they were given construction material or were exempted from taxes – for example in the trade market flooded by Caşin in Oneşti in July 2005).

d)the perception of public authorities risk management strategies

The connection with the authorities is the key to a proper and efficient risk management in every comunity. In this survey, only 10,6% consider the authorities do everything they can to prevent and mitigate flood effects (68% of them being people who were never affected by floods), while 54,6% don't trust them and declared they don't do what they should and 34,8% just don't know. Some of the participants even added that they feel a greater knowledge on flood exposed areas is needed.

This lack of confidence is also shown when asked about the measures undertaken by authorities in risk mitigation: 19,3% stated authorities did nothing, 16% don't know, 34,2% pointed to river dyking as main measure, 18% chose river regulation and 12,5% had multiple anwers, taking into consideration all the above and also other measures, such as repairing bridges or reforestation of some areas. However, people generally feel that after 1989, when the riverbanks were allready consolidated, authorities didn't do much. Also, regarding the measures taken after

the flood 17,3% said no measures were taken, 20% don't know (42,1% indicated warning the population about the threat as main measure).

e)the level of concern related to flood risks in the region

The results of the survey show that 10,5% are not concerned (53,3% urban dwellers and 60% females) about this risk, 49,2% are a little concerned, talking sometimes with their friends about floods (56,3% females), 31,7% are concerned enough, they inform themselves and talk often about floods (70,4% females) and 8,6% (58,3% of them women) are very preoccupied with this, fearing another flood would soon produce. Almost all of the participants who are not concerned (93%) were also never affected by floods, while none of those who suffered damages declared they were not concerned. When asked if they had ever seen a flood risk map of the region, 26% said yes (33% of them with college degree), 67,3% said no and 6,7% don't know. Taking into consideration that such maps are rare, we think some of the subjects mistook this map for the map of flooded areas.

f)school children's perception on floods

119 pupils from some schools and highschools in the Tazlău-Caşin depression (both rural and urban areas), aged from 8 to 18 years, were asked to answer a questionnaire about floods of 24 multiple-answer questions, related to 3 major themes: general information on floods, the perception of floods as risk and threat and the civic behaviour in case of a flood.

In general, pupils know what floods are (85%), but have some troubles in defining the „easily flooded areas" (just like the adults do). A percentage of 90,8% are aware of the need to get involved in floods prevention, but only 74% know that measures to fight floods exist (26% stated floods can't be prevented), mainly due to the poor populatization of these methods. 81% of school children know how to react in case of a flood, at least in theory, because 15% would still pick the most unappropriate places to take cover (such as cellars) – this shows that they actually don't fully understand the all the mechanisms of floods.

The most challenging questions were those concerning the threats they are exposed to after the floods (such as diseases or infested water): 48% don't know the health problems they are exposed to (typhoid fever or hepatitis), 75% know they have to drink only bottled water after floods and 18% think they can figure out themselves if the water is drinkable, without a lab exam. The differences between pupils living in rural or urban areas were not noticeable, probably due to the way the questions were formulated; there is just a slightly higher level of theoretical knowledge at urban schools pupils.

Also, there is the same lack of information regarding public authorities risk management, as pupils don't really know who is responsible in case of emergency situations: only 65% stated the local authorities (city hall) are responsible, while 13% hold the president and 22% the Water Management minister as responsibles.

4. Conclusions

Coping with floods is connected with a number of activities, counter-measures and the actors who perform them. In order to have an efficient risk management, more of these public surveys should be conducted and thoroughly analysed.

There is a strong need for river monitoring and keeping people informed, proper development of spatial planning and river regulation, educating and training people about floods and proper reactions during flood events, as well as stimulating proper preparation (e.g. insurance).

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