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DEALING WITH NATURAL DISASTERS IN A POSTSOCIALISTS SOCIETY - THE EXAMPLE OF SLOVENIA

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Abstract

Many countries around the world are facing increasing impacts of natural disasters. This is primarily attributed to climate change, accompanied by an increase in the intensity of meteorological and hydro-geomorphological natural hazards. However, is climate change really responsible for this increased damage and low resilience, or should the cause be sought elsewhere? Based on the case of Slovenia, it is shown that social irresponsibility (e.g., inadequate spatial planning, lack of supervision, insufficient insurance policies, and a mix of politics and capital influences) could be a factor more responsible than climate change for the "catastrophic" consequences of natural disasters.

Keywords: *geography, natural disasters, resilience, irresponsibility, Slovenia*.

INTRODUCTION

Increasing impacts of natural disasters are often associated with global climate change. With changes in air temperature and the quantity and intensity of precipitation, climate change is influencing the frequency, distribution, and force of weather-related disasters and subsequent hydro-geomorphological processes [1, 2].

Climate change is closely connected with the increase in damage caused by natural disasters [3]. During the 1950s, this damage amounted to approximately USD 3.9 billion at the global level, whereas over the past decade it has already amounted to approximately USD 190 billion a year [4]. Such an increase in damage is primarily connected with modern society's increased vulnerability to natural disasters, which primarily results from an increase in population and urbanization in hazardous areas, and an increase in the value of land, buildings, and infrastructure, not to mention modern society's poor adaptation to natural disasters [3].

In many societies the increase in damage caused by natural disasters can also be connected to social irresponsibility, e.g. (1) inadequate spatial planning, (2) lack of supervision, (3) insufficient insurance policies, and (4) a mix of politics and capital influences. We will show these on the example of Slovenia.

INADEQUATE SPATIAL PLANNING

The Slovenian Resolution on a National Program of Protection Against Natural and Other Disasters [5] states that spatial planning is by far the most important and also the least expensive instrument for adapting the use of space to natural conditions. This is also observed by the basic legal act on protection against natural disasters [6], requiring that, in planning and in the construction of buildings and other structures, spatial, urban planning, and other technical measures be employed in order to prevent or reduce the harmful effects of natural disasters.

The Waters Act (Article 83) [7] is more specific, requiring that hazardous areas be identified–that is, that susceptibility maps be produced for areas threatened by floods, erosion, landslides, and avalanches. According to Spatial Planning Act (Article 55) "*spatial plans of local significance due to the impacts of natural or other disasters not specified in the municipal spatial plan*" should be produced for the purposes of developing detailed municipal spatial plans [8].

Despite Slovenia's high susceptibility to various natural hazards, to date only a few municipalities have prepared adequate expert bases, even though they are required by an EU directive (e.g., flood maps) [9]. Susceptibility maps for slope processes (landslides and avalanches) cover only a tenth of Slovenia's territory, even though at least one-fifth of the country is in urgent need of such maps. Approximately EUR 1 million would be required to produce them, which is barely one percent of the direct damage that landslides and avalanches caused in Slovenia between 1994 and 2008. Approximately EUR 4.5 million–or less than 5% of direct damage caused from 1994 to 2008–would be required to cover the entire country [10].

Floods: the city of Ljubljana (central Slovenia)

Inadequate spatial planning comes to the fore especially in the case of floods. The Ljubljana Marsh (*Ljubljansko barje*) is characterized by a double threat, being affected by both karst floods and flash floods. In the past, people were aware of the danger and even in the early 1960s Ljubljana still extended only to the northern edges of the Ljubljana Marsh (Figure 1) and somewhat further down to the south along some main streets. This was followed by planned construction of large residential neighbourhoods and also unplanned urbanization. The majority of illegally built buildings were legalized after 1990, further enhancing the pressure on the city's southern margins. In the flood-prone area, the population has grown from a few thousand to over 30,000 in only a few decades. A great deal of public infrastructure was also built in hazardous areas and people now demand its protection against floods. The spread of Ljubljana's southern neighbourhoods to the flood-prone area is a typical example of the principles of sustainable development not being met in practice [2].

Flood safety in this part of Ljubljana is planned to be created by building detention reservoirs west of Ljubljana and a flood control channel in the Ljubljana Marsh. A solely structural approach violates the provisions of the EU Directive on the Assessment and Management of Flood Risks [9], which favours non-structural initiatives.

The envisaged structural initiatives contribute to greater flood safety, but they also alter the natural processes at valley bottoms that are important in terms of ecology, recreation, landscape, and the economy. In flash-flood zones, the transport and rapid sediment deposition during flash floods are the most problematic. During major storms,

the detention reservoirs rapidly fill up with sediments, which reduces their anti-flood function and drastically increases the financial and environmental costs of their maintenance. These types of initiatives are also problematic because the construction of detention reservoirs introduces a false impression of flood safety further downstream. In the coming years, the growth of settlements will further enhance the pressure on the flood-prone landscape, exerting exactly the opposite effect in the long run than what was expected [2].

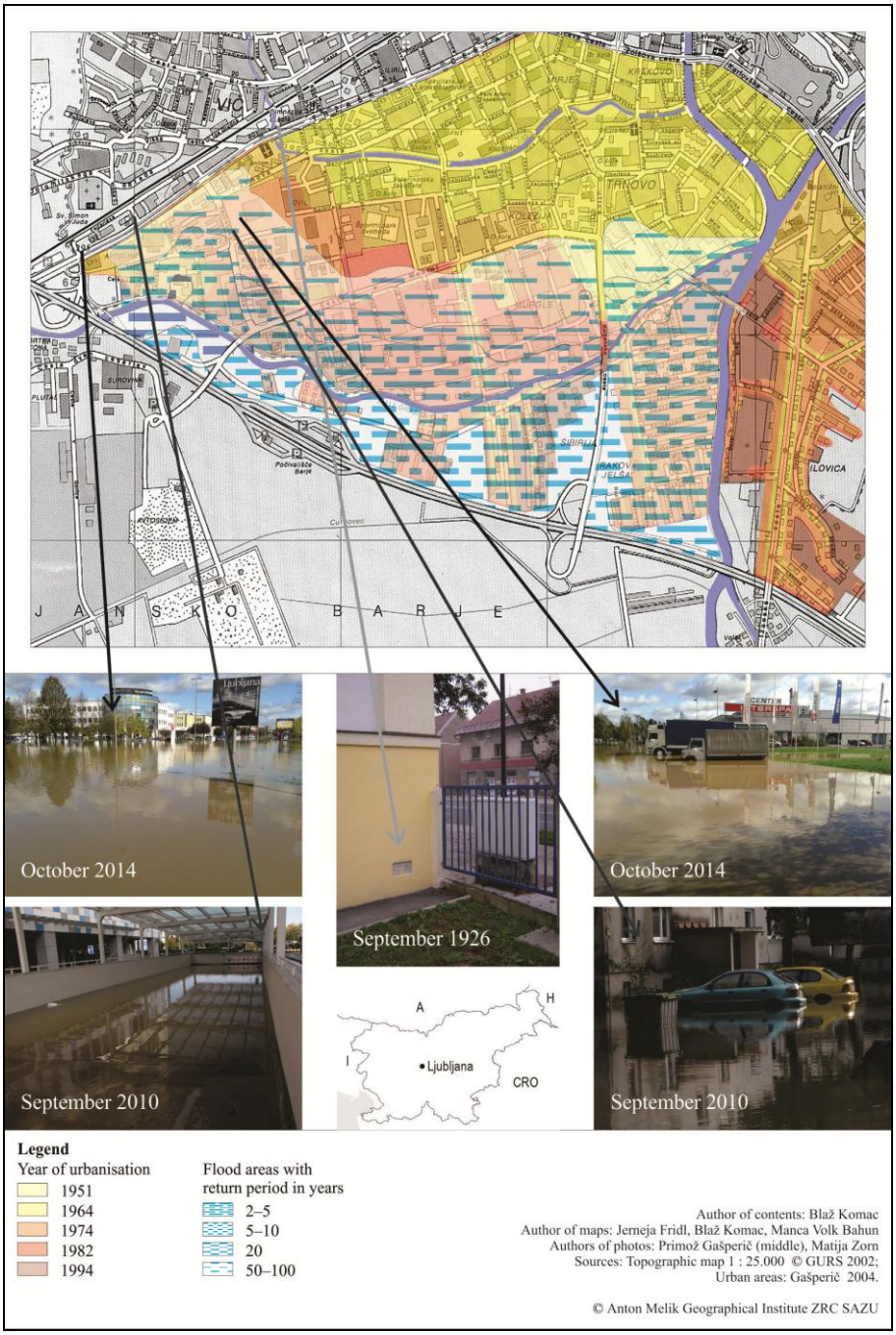

Figure 1: Flood hazards in the southern part of the Slovenian capital of Ljubljana, and the 1926, 2010, and 2014 floods [2].

LACK OF SUPERVISION

A lack of supervision was seen after the sequence of earthquakes (in 1976, 1998, and 2004) in the Upper Soča Valley (northwest Slovenia). Many deficiencies came to the fore in past post-earthquake recovery, with reconstructed buildings not being suitably adapted to future earthquakes [11].

With the 1998 earthquake (April 12th; M 5.6; Figure 2), it turned out that the reconstruction and reinforcement of buildings after the 1976 earthquakes (May 6th; M 6.5; September 15th; M 6.1) had often been poor or incomplete. After the 2004 earthquake (July 12th; M 4.9), a similar deficiency was established regarding recovery following the 1998 earthquake [12]. This happened even though recovery after the 1998 earthquake had to be "*managed uniformly and based on equal principles regarding all affected parties*" and with the goal "*to reconstruct structures in a professional and sustainable manner, and to reinforce them to be able to sustain an earthquake at least one magnitude higher than that of the earthquake of April 12th, 1998*" [13, p. 301] and even though a special law, the Post-Earthquake Reconstruction of Structures and Development Promotion in the Soča Valley Act [14], had been adopted. At the end of 2001, those in charge already boasted about "*successful post-earthquake recovery*" [13, p. 303].

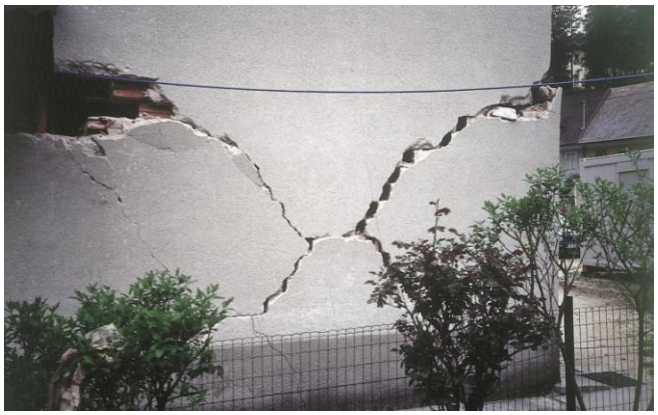

Figure 2: Typical damage caused to houses in the town of Bovec during the 1998 earthquake (photo: Matija Zorn).

A number of questions arise in this regard [12]: why did major damage occur again with the 2004 earthquake? Were the reinforcement projects after the 1998 earthquake carried out properly? Was the execution in line with the projects? Did reinforcement make sense at all or would it have been more effective to build the structures completely from scratch? Which regulation should be applied to ensuring the earthquake resistance of damaged structures? The reconstruction of old stone walls bound with weak mortar made of homemade lime proved to be problematic. Expensive injection of these walls did not yield satisfying results because the cement often failed to reach the structurally weaker parts. Based on the reconstruction experience after the 1976 earthquakes, construction of modern prefabricated houses, which are generally more earthquake-safe, was prohibited (keeping in mind the result of the 1976 reconstruction of Breginj settlement where a lot of cultural heritage was lost). During the 2004 earthquake, the damage to many structures that had barely been reconstructed was such that large numbers had to be razed and replaced with new ones. Some of the new structures were built using donor funds, but the lack of transparency in selecting the recipients of the

donor-funded houses caused disagreements because there were instances of inequality before the law. The recovery was also criticized for the low quality of construction, inadequate supervision that worked against the damaged parties (charging for work not carried out), extortionate prices for demolition up to three times higher than normal, as well as for planning and construction, and fairly unfavourable loans that the residents were forced to take out for a specific share of the reconstruction value [2].

INSURANCE POLICY

The selection of coverage for the damage caused by different natural disasters varies between insurance companies in Slovenia: some include natural disasters in basic coverage, some include them as an option for which a surcharge is required, and others do not offer coverage for specific types of natural disasters. This type of insurance is most often part of the insurance against fires. People can take out insurance against fires, lightning strikes, storms, hail, floods, landslides or avalanches, slumping, rainwater, sleet, frost, or earthquakes. Something similar applies to home insurance. Farmers can insure their animals and crops against hail, fires, lightning strikes, spring frost, storms, or floods. Animals can be insured against fires, lightning strikes, storms, floods, landslides or avalanches, and high or low temperatures [2].

Insurance companies are partly responsible for low insurance coverage (Figure 3), but one should bear in mind that insurance against natural disasters is not required in Slovenia. In addition, those that have taken out property insurance have not benefited much from compensation for damage paid by the government. In fact, exactly the opposite is true: during recovery after the 1998 earthquake, the government was criticized for unjustly and unlawfully confiscating the insurance benefits of everyone that had insured their buildings against earthquakes. This means that the government, through which recovery took place in accordance with the law, penalized those that had insured their real estate before the earthquake. Similarly, after the September 2007 floods, companies that had not insured their structures and equipment were entitled to 50% of grants for the costs incurred during the floods, whereas those that had the insurance were entitled to 70 to 80% [2].

In addition to the fact that insurance is not required, awareness of the hazard is also important. A German study on floods showed that only half of the population remembers the catastrophic floods from ten years ago and that practically nobody remembers such floods from more than forty years ago [15].

In the 1980s, a survey was conducted in southern Ljubljana showing that 72% of the residents interviewed were aware that floods were possible in the area where they live, whereas 59% were unaware of the fact that the area had already flooded in the past. The influence of an individual's experience on taking out insurance is also suggested by the fact that during the 2002 floods in Germany (causing damage in the amount of USD 18 billion) one-fifth of the housing was insured, whereas nearly a third was insured during the 2013 floods in the same area (causing damage in the amount of USD 15.2 billion) [2].

The significance of personal experience has also been established in the case of earthquakes. During the first year after an earthquake, there is great determination among people to take out insurance against earthquakes. This slowly declines up to five

years after the earthquake, and later on (five to ten years after the earthquake) people start intentionally declining any costs related with that [11].

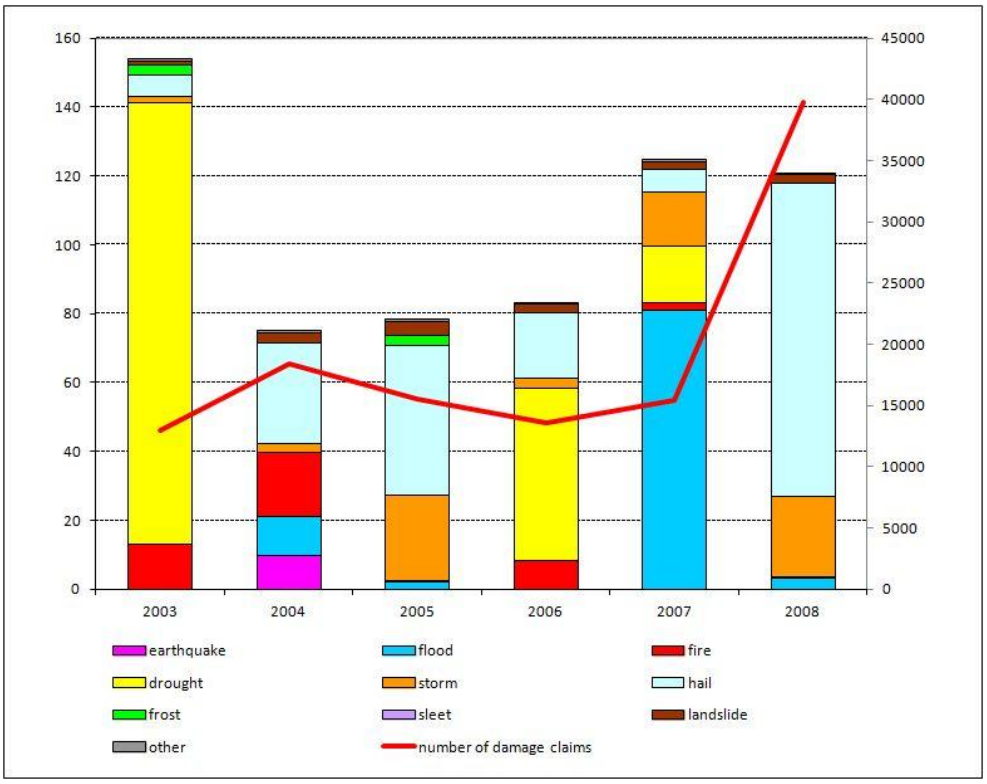

Figure 3: Damage and insured damage due to natural disasters in Slovenia from 2003 to 2008. There is a significantly greater share of insurance against hail (e.g., in 2004 and 2008) than against drought (in 2003 and 2006), which is primarily the result of people taking out comprehensive car insurance, which also includes coverage against hail [2].

A MIX OF POLITICS AND CAPITAL

One can often read in the media [16] that "*politicians are giving way to the pressure of property developers and, despite objections from hydrological services, new construction is permitted on river banks–and, when a catastrophe occurs, sympathy payments are simply provided.*"

One of the best known examples of these in Slovenian is the 2007 flood in the town of Laško (east Slovenia). Even though the natural conditions in Laško prevent carrying out any major preventive measures and one should avoid altering flood-prone areas, the government issued a special decree allowing the local spa to expand into the flood zone along the river [16].

The consequences were as expected: the September 2007 floods caused damage in the amount of EUR 1.8 million to the facility; admission fees from 205,000 spa visitors would have to be collected to cover this sum. The government response was completely against any sustainable development criteria and laws because the government offered immediate aid.

Unfortunately, Laško is not an isolated case. Despite the legal provisions in force (i.e., the 2002 Waters Act [7] and the 2007 Spatial Planning Act [8]), hundreds of residential,

business, commercial, school, and other buildings have been legally built on flood-prone areas in Slovenia [17].

CONCLUSION

The basic question arising from the cases presented is that of responsibility. In the past, the responsibility for damage caused by natural disasters was mainly borne by society. Even legislation promotes the distribution of prevention responsibility across the wider, municipal community. More specifically, the law (i.e., Protection Against Natural and Other Disasters Act) ascribes responsibility for personal protection to the local community, rather than explicitly to individuals [6].

However, with the increasing individualization of society, one can also expect a trend towards taking personal responsibility in the event of natural disasters. The system of allocating aid in the event of natural disasters may positively take into account the individual's responsibility for self-protection in the sense of preventive technical measures and taking out proper insurance.

The issue of insurance and other types of self-protection is related to the question of who will bear the responsibility for potential damage.

After the 1998 earthquake in the Upper Soča Valley, no one raised any questions about the responsibility of those building their own houses and developers for the great damage caused by what was a relatively weak earthquake (from the global perspective). In addition, no one asked any questions about damage caused by potential negligence or even intentional underestimation of protective measures, especially for buildings owned by the municipalities, as municipalities are responsible for construction being professionally carried out. Something similar applies to other major natural disasters, especially floods, in which the high point that the floodwater reaches is usually known.

Turning responsibility over to the individual will probably also be necessary because of increasingly limited government funds available for compensation for damage caused by natural disasters. For now, legislative inconsistencies and vagueness, and an inert insurance system are discouraging individuals from taking responsibility. In order to improve the situation, a great deal still remains to be done with regard to education and awareness rising. Unfortunately, in Slovenia the role of individuals as well as developers, municipalities (responsible for spatial plans), or administrative units (responsible for building permits) in dealing with natural disasters leaves much to be desired. One should be aware that natural disasters are not a *force majeure* against which people should be protected by a national government. Developers should be at least financially and morally responsible for the damage if they fail to carry out the required protective measures [11].

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