POLITICAL REGULATIONS AND SOCIAL PERCEPTION OF NATURAL RISKS: "RISK SOCIETY", THE CZECH EXPERIENCE AND THE EUROPEAN CONTEXT

PAVEL RAŠKA

J. E. Purkyně University, Faculty of Science, Department of Geography

ABSTRACT

Recently, the political and social notion of natural risks and disasters has gained increasing attention, partly as a result of high-magnitude disaster events in last decades. In this regard, the concept of social vulnerability has been incorporated into international legal frameworks and strategies of disaster risk reduction, emphasizing that the effective ways to reduce natural risks are inherently related to social action at different institutional levels. The shift in research agenda towards vulnerability assessment and social notion of natural risks seems to be less intensive in Czechia, however, which is due to epistemological traditions in geosciences and regional studies in the country. Therefore, the background aim of the study is to raise a discussion on emerging research themes for geoscientists and regionalists in the country-wide perspective through the two specific aims. First, we evaluated the success of Czech political representatives in implementing the international legal frameworks and strategies into the national and regional policies. Our results of analysis of strategic documents and legal frameworks suggest that although the issue of natural risks is well incorporated into the strategic documents and legal frameworks in Czechia, these documents do not sufficiently reflect the international agreement on the necessity of a conceptual shift towards a social vulnerability concept within disaster risk reduction. Second, we analysed social perception of natural risks in a case study of the city of Ústí nad Labem in northern Czechia. On one hand, the analysis has revealed that the issue of natural risks, represents an important short-term decisive factor for local community. On the other hand, the long-term perception of natural risks, as analysed using the econometric data about the impacts of natural hazards on real estate property, has shown that the social perception of risk, during the periods between the individual disaster events and after these events is relatively weak. This may represent a significant constraint for the implementation of community-based strategies of disaster risk reduction.

Keywords: natural risk, risk society, legal documents, social perception, Czechia

1. Introduction

1.1 Social vulnerability to natural disasters

During the last three decades, the social notion of natural risks and disasters has gained increasing attention in the literature. After several papers were published since the 1950s, Hewitt's work (Hewitt 1983) became a landmark for social scientists, establishing a human ecological perspective to disaster studies. Later, the general perspective of the approach was guided by the emergence of the concept of risk society, which was introduced by Beck (1992) and further developed by Giddens (1999). In his seminal work, Giddens noted that the risk society is a society that is increasingly engaged with its future and that produces phenomena and processes that are well beyond the experiences of that society. The emergence of the risk society is then reflected by politicians, he continues, who tend to represent their social responsibility by scaremongering; however, no one is in fact specifically responsible for the impacts of risks, and the state is referred to as "organised irresponsibility". The research agenda of social sciences has encountered natural risks and their impacts as a social process (Breakwell 2001; Wisner et al. 2004), and significant effort has been made to study the social production of natural risks and their impacts. Steinberg (2000), for instance, argued that it was a common practice of local and national government in the United States to put the blame for risks on random extreme natural processes, which cannot be forecast, to avoid the responsibility for the impacts of natural risk and to justify socially unequal policies.

In this regard, studies on the social aspects of natural risks have been a counterbalance to the geologic, geomorphologic and hydrometeorologic research of natural hazards, although some issues of the social and economic impacts of natural hazards have been incorporated into the studies done in these disciplines through the economic impact analyses (Schuster, Highland 2001; Fleming, Taylor 1980) and vulnerability assessments (Alcantara-Ayala, Goudie 2010; Hufschmidt 2011). Despite bringing both the social- and geo-scientific research approaches closer together, the a priori preference of these disciplines towards certain components of the natural risk model as constructed in Genève (UNDRO 1979) is still obvious. To a certain degree, such preferences are self-evident and logical because the focal disciplines dealing with natural risks have different epistemologies resulting in various methods and techniques employed (Cutter 1996; Alcantara-Ayala 2008; Cardona 2008; Raška, Anděl 2012). The social scientific approaches have deeply criticised the natural and applied sciences for their approach

To be quoted as:
Raška, P. (2013): Political regulations and social perception of natural risks: "risk society", the Czech experience and the European context
AUC Geographica, 48, No. 2, pp. 61–74

to vulnerability as a process limited to potential physical damage or to demographic determinants (cf. Blahůt and Klimeš 2011). According to these critiques, "the vulnerability cannot be defined or measured without reference to the capacity of a population to absorb, respond and recover from the impact of the event" (Cardona 2008: p. 43).

1.2 The emergence of community-based strategies and the political action

According to the above mentioned perspective, the effective ways to reduce natural risks are inherently related to social action at different institutional levels, ranging from global and national policies and across regional governance to the business sector and especially to the local communities. Lately, many authors have argued for the fundamental role of community-based (local-based) strategies to mitigate the impacts of natural disasters. These strategies were studied using various sociological frameworks and resulted in a shift from hazard-based to vulnerability-based mitigation strategies within the disaster cycle (Sarewitz et al. 2003; Pelling 2003; Peltonen in Schmidt-Thomé 2006 ed.). Drawing upon the concept of risk society and social activities in disaster risks reduction, recent studies dealing with community-based strategies have aimed at both policy frameworks (e.g., Pelling 2003; Manuel-Navarrete et al. 2011) and the social perception of natural risks (Slovic 1987; Placer, Delquie 1999; Bruen, Gebre 2001). Among other issues, the studies on risk perception have focused on the question "how natural risks are understood by public and how public perceive political action and expert discussions concerned with natural risk mitigation?" (e.g., Sjöberg 1999). These studies resulted in considerations on necessity of complex learning from disasters (e.g., Choularton 2001; Corbacioglu, Kapucu 2006), even though Bubeck et al. (2012) has shown on the example of floods that the adoption of private mitigation measures cannot be clearly statistically explained by increased social perception of natural risks.

Along with and in part as the result of the social scientific research on natural risks, the notion of natural risks has also come to be increasingly appreciated in European policies. Accordingly, due to the effort of the United Nations in identifying the most vulnerable regions, evaluating the frequencies and environmental links of natural risks and setting the strategies for disaster reduction (e.g., UNDRO 1979; UN 2005), the European Union and individual European countries have made a huge effort to include these issues in their legal documents and policies (e.g., EC 2010) by having a pro-active attitude toward disaster risk reduction in setting regional policies and within local communities. Judging from these documents, the political regulation in natural risk issues seems to be a matter-of-course. In contrast, the efficacy of implementing the legal agreements and mitigation strategies at the regional and local levels is not so clear. Ambiguities arise when taking into account the social perception of natural risks because various communities have different experiences with natural risks due to different degrees of exposure as well as the cultural and intellectual determinants among these communities. Dostál (2010), for instance, has used the data from Eurobarometer to assess the different attitudes towards the environment and environmental policy in members states of the European Union (EU). His results indicate that, although there is a certain association of natural disasters when discussing the environment across the EU, the attitude toward the environment in the old member states is based upon post-materialistic values and abstract cognitive insights and tends to be more general, while the attitudes of people in the new member states from East-Central Europe is based upon the direct experience of material survival. Taking these results into account and drawing upon territorial inequalities in environmental quality and in the social and economic impacts of natural risks in the last few decades within the European countries (CRED 2009; MunichRe 2009), we may suppose that such perceptual differences would be observed on a regional scale of individual countries as well.

Finally, these results indicate that the general concept of a risk society can hardly be self-explanatory and useful in the practice of natural risk mitigation, if not studied at various territorial levels in different natural and cultural settings. Despite the fundamental meaning of the risk society concept for a social theory, the constraints of the risk society concept for the practice of natural risk reduction are as follows: (a) the concept tackles a broad spectre of risks without any particular emphasis on natural risks and (b) the concept explains general societal behaviours (of Western Civilisation) regardless of concrete regional setting of risks. Accordingly, the efficacy of international efforts to set out community-based strategies for disaster risk reduction must be evaluated at the regional and local levels.

1.3 Research aims

Contrarily to the situation abroad, there has been a rather limited effort to study the political and social aspects of natural risks in Czechia, however. The pioneering works of Dostál (2005, 2008), Vilímek and Spilková (2009) and Blahůt and Klimeš (2011) have focused on the theoretical considerations of methodological plurality within the (natural) risks studies and on terminological questions, but not on the social production of natural risk itself. The reason for the lack of studies dealing with social dimension of natural risks in Czechia may be explained by epistemological traditions within the geoscientific and regional studies. While the physical geographers has long pursued the geoecological and palaeoenvironmental paradigm in the study of natural environment, the social geographers and regionalists focused on interactions within the social system

itself (Hampl et al. 2007), and therefore the complex approach to natural risks has been a latecomer in the research agenda.

The aim of this study is to evaluate the level of political regulation and the social perception of natural risks in Czechia. As a member state of the EU, Czechia must act in accordance with the general legal frameworks for natural risk reduction. Therefore, our first aim is to discuss how successful the Czech political representatives were in implementing these frameworks and the latest approaches of social scientific insight into the natural risk issue into the national and regional policies. The background aim of the study is to raise a discussion on emerging research themes for geoscientists and regionalists in the country perspective.

Most of the research will be carried out in urban regions (Figure 1), which enables us to assess the links between policies at different territorial levels, on the one hand, and the massive social experience with natural risks, on the other. The country-wide analyses will be put in a European context and based upon content and discoursive analyses of legal and strategic documents. If the political acceptance of the social vulnerability concept is to be efficient in disaster risk reduction, it must in turn be counterbalanced by the increasing social notion of natural risks in local communities (Delica-Willison, Willison 2008) and by complex organizational learning (Corbacioglu, Kapucu 2006; Innocenti, Albrito 2011). Therefore, the second aim of this study is to analyse the social response to natural risks in Czechia with the case study from the city of Ústí nad Labem, which is based on the combined methodologies of environmental geography and sociology for the analysis of both the short-term and long-term impacts of natural risks on a social system of the urban region.

2. The political regulations of natural risks: the view through legal and strategic documents

The current attention paid to natural risks by various disciplines undoubtedly results from the increasing frequency of documented disaster events in the latter part of the 20th Century. The annual report of the MunichRe (MunichRe 2009) reveals that the number of disaster events has doubled between the years 1980 and 2009. The majority of these disasters are categorised among the hydrologic and meteorological extremes. Although

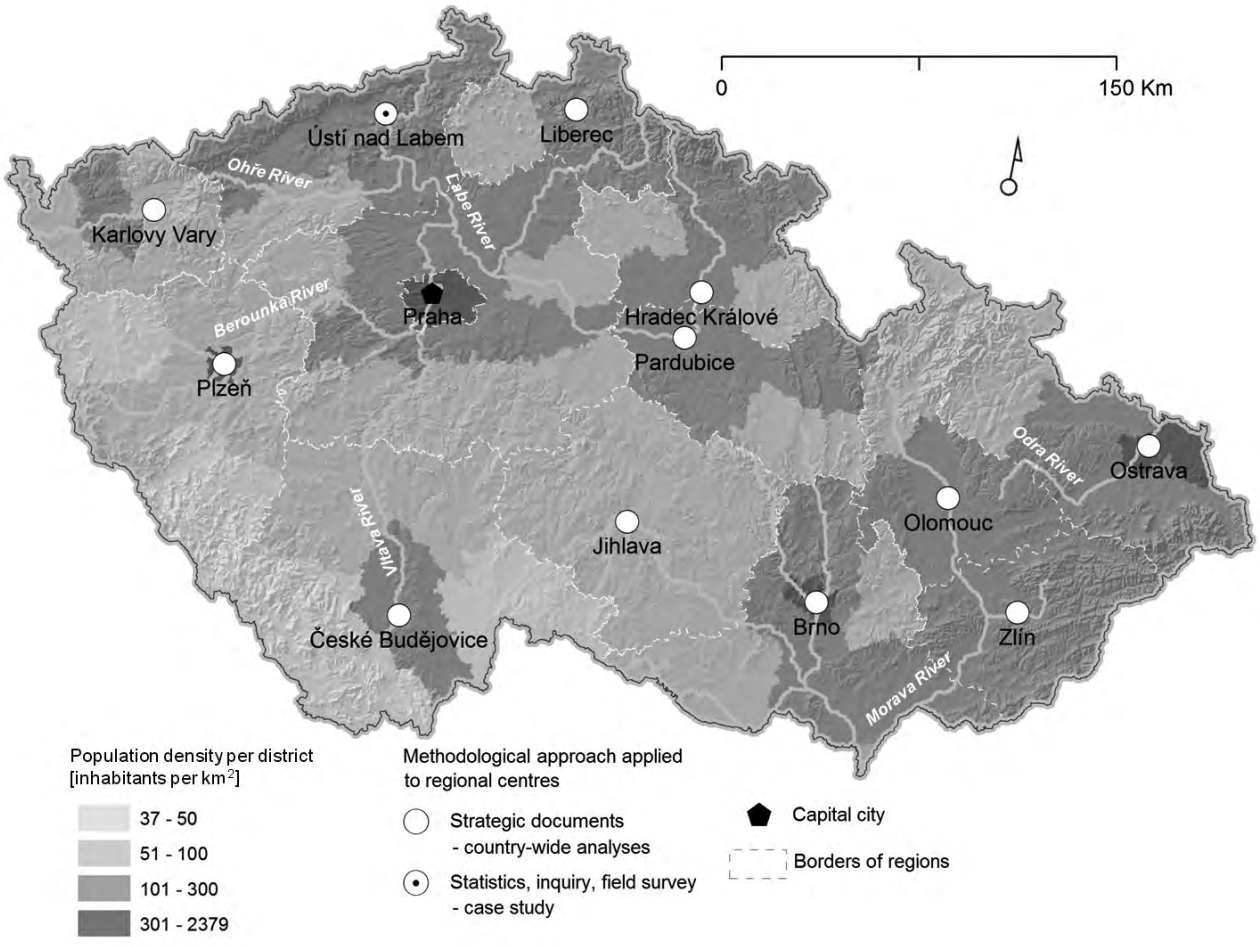

Fig. 1 Urban regions (regional centres) analysed in this study.

the increase of documented events does not necessarily represent a real increase in the frequency of the disaster events, even a stable frequency of disaster events may have larger social and economic impacts because of the greater vulnerability of societies. An increase in the social impacts of disaster events is apparently shown by the rising number of insured losses (MunichRe 2009), even though not all possible disaster impacts may be insured. During the period between 1980 and 2009, the member states of the European Environmental Agency faced approximately 4,500 disasters that caused 108,000 casualties (EEA 2010). While the majority of the casualties were caused by earthquakes and meteorological extremes (high temperature waves), the hydrologic (floods, flash floods) and meteorological (rainstorms, etc.) events are responsible for the highest economic losses. However, the quantitative data regarding losses can hardly represent the objective degree of risk, because various types of natural risks affect different societies with varying intensities (e.g., Raška and Anděl 2012).

The existing disaster statistics and recent progress in vulnerability analyses and mapping have pushed political representatives to conceptualise the fight for disaster reduction by creating legal frameworks and strategic documents for the implementation of these efforts. The Report of Expert Group Meeting of the Office of the United Nations Disaster Relief Coordinator (UNDRO 1979) has become a milestone for the political regulation of natural risks. During the next few decades, the international organisations have made an immense effort to set out the appropriate policies of disaster risk reduction. The major strategic documents resulting from this effort are summarised in Table 1.

Along with their institutional (legal) aspect, the aims of these documents illustrate the discoursive shift of disaster studies toward the social vulnerability concept and the creation of community-based strategies for coping with disastrous events. The 1990s were designated as an International Decade for Natural Disaster Reduction. After the World Conference on Disaster Reduction in Yokohama, Japan in 1994, the United Nations General

Tab. 1 Selected Global and European strategic documents and reports concerned with the issue of natural hazards and risk.

Title	Source	Major focuses
Natural disasters and vulnerability assessment	The United Nations Disaster Relief Organization (UNDRO 1979)	definition of basic terms, conceptualisation of natural disasters, aims of future action
International Strategy for Disaster Reduction	The United Nations (UN 1999)	strategic and systemic approach to disaster impact reduction
The Hyogo Framework for Action	United Nations (UN 2005)	strategic and systemic approach to disaster impact reduction at different institutional levels
EU Strategy for supporting disaster risk reduction in developing countries Implementation Plan of the EU Strategy for supporting disaster risk reduction in developing countries 2011–2014	European Commission (EC 2009, 2011)	strategy of sustainable development through reducing the impacts of disasters in developing countries
Making Cities Resilient. My City is Getting Ready	The United Nations Office for Disaster Risk Reduction (UNISDR 2010)	improving knowledge and coping strategies of local urban population
Disaster Risk Management and climate Change Adaptation in Europe and Central Asia	World Bank Global Facility for Disaster Reduction and Recovery (WB 2010)	financial and insurance instruments, overview of risk mitigation measures, emergency management, public policy
Mapping the impacts of natural hazards and technological accidents in Europe: An overview of the last decade	European Environmental Agency (EEA 2010)	review and statistics of natural hazards and their impacts
A Community approach on the prevention of natural and man-made disasters	European Parliament (EC 2010), based on EC communication	research, cooperation of actors, improving legislative and financial instruments
Revealing Risk, Redefining Development – Global Assessment Report on Disaster Risk Reduction 2011	United Nations (UN 2011)	assessment of implementation and progress of disaster reduction strategies into global and regional policies, defining regional development strategies, problem of droughts as hidden risk
Humanitarian Emergency Response Review	HERR (2011), United Kingdom	report on humanitarian help
Towards a stronger European disaster response: the role of civil protection and humanitarian assistance	European Commission and Parliament (EC 2011)	increasing the efficiency of disaster response, creation of European Emergency Response Capacity, creating maps and scenarios
Prevention of natural disasters in Europe and Latin America	Euro-Latinoamerican Parliamentary Assembly (EuroLat 2013)	strategies of prevention and reduction of impacts of natural hazards, fight against climate change, monitoring and research, governmental action

Assembly adopted the International Strategy for Disaster Reduction at the turn of 1999 and 2000 and has established The United Nations Office for Disaster Risk Reduction, which is responsible for the implementation of further agreements, especially The Hyogo Framework for Action for the years 2005–2015 (UN 2005). Similar to the United Nations, The European Union institutions have conceptualised the strategy of disaster reduction through their legal frameworks with a significant focus on community-based approaches and civil protection during and between the natural risk events (EC 2010, 2011).

Within the Czech milieu, the issue of natural risks has been long incorporated into legal documents with a particular focus on crisis management during the disaster events. The process of crisis management is described mainly in Act No. 240/2000 of Crisis Management and Act No. 241/2000 of Economic Measures during the Crisis Situation. The other legal acts are devoted to (a) the strategy of an integrated emergency system (Act No. 239/2000) and the duties of public actors during the emergency, such as army forces (Act No. 219/1999) and fire departments (Act No. 237/2000), and (b) the protection against disaster events within the specific territorial and landscape features (landscape protection in Act 114/1992, water bodies in Act No. 254/2001, etc.). Most of these legal frameworks do not represent the strategy for disaster risk reduction, however. The shift toward these strategic reduction measures may be observed during the last 15 years primarily as the result of high magnitude flood events in 1997 and 2002. Since that time, the natural risk issue has been increasingly incorporated into general safety strategies (the Safety strategy of the Czech Republic, starting with 1999 and actualised in 2001, 2003 and 2011) and into strategies that are directly aimed at disaster risk reduction, e.g., the Strategy of protection against floods (Collective 2000) and Act No. 236/2002 Methods for Delimitation of Flood Areas. Moreover, Czechia has become a member of National Platforms for Disaster Risk Reduction in Europe and participated in the Natural and Technological Risk theme within the ESPON Programme (European Observation Network, Territorial Development and Cohesion). Nevertheless, the discoursive shift from hazard-based to vulnerability-based strategies (Sarewitz et al. 2003) has not been so successful. While there is rising support for research teams studying natural hazards and risks (Falc 2001), the overall mitigation strategies are still largely focused on measures after the disaster events rather than systemic disaster risk reduction (Čamrová 2006).

Considering the recent international agreement regarding the necessity for establishing community-based strategies for natural risk reduction, we have performed analyses of regional planning documents for regional centres in Czechia along with the national legal frameworks. The Integrated Plans of City Development (IPCD) have been selected as the appropriate types of documents because they represent the up-to-date strategic frameworks for the development of urban centres as created by the local authorities. In addition, the primary goal of the IPCDs is to establish a framework for obtaining the financial support from the European Structural Funds, and therefore they are clearly linked to higher territorial level strategies. We have analysed 24 IPCDs of 12 regional centres except Prague (Praha) and Central Bohemia. Although the exposure to different natural hazards in these cities varies, each of these regional centres is exposed to at least some of the hazards. Some of the IPCDs are devoted to the entire city, while part of the analysed documents deals only with certain city quarters. The results of our analysis (Table 2) indicate that the natural risk issues are mostly discussed in the IPCD designed for the whole city. Most of the comments on natural risk are related to floods, while the discussion of geologic (e.g., landslides) and meteorological (e.g., storms, heat waves) risks is absent. In 58% of the IPCDs, there is only a scarce comment on natural risks, mostly in the analytic part of the document and in the SWOT analysis, noting the presence of past natural risk events. Natural risks represent a central component of the IPCD in only a few cities (Plzeň, České Budějovice), where these risks are considered an important factor to implement the strategic aims of city development. In both Plzeň and České Budějovice, the importance given to the natural risk issue is influenced by past flood events at the Berounka and Vltava Rivers, respectively. In the IPCDs that pay detailed attention to natural risks, the comments are usually related to flood prevention, the protection against floods, economic measures during the flood events, flood and evacuation plans, and the application of flood issues to environmental education (IPCD Ústí nad Labem – Centre). In this respect, natural risk issues represent an integral, although minor, segment of the development strategies of regional centres. In contrast, only minor progress can be seen in the conceptual shift toward social vulnerability strategies of disaster risk reduction within the IPCDs, where only the IPCD of the city of Ústí nad Labem includes the example of educational goals to reduce natural risks through the vulnerability concept. In contrast to the national strategic documents and to the IPCDs, which include more or less explicit discussion of natural risk issues, the nationwide document Principles of Urban Policy, published by the Czech Department of Regional Development (Collective 2010), includes only non-specific comments concerning newly arising threats to the urban environment and the necessity for a complex approach to natural risk mitigation. Any comment on natural risk is lacking in the description of the strategic goals devoted to the urban environment, which is in strict contrast to the international documents devoted to urban development (Kreimer et al. 2003; UNISDR 2010).

Tab. 2 Results of analyses of Integrated Plans of City Development.

	analysed IPCD		issues related to natural hazards			
			brief comments		detailed comments	
	n	f [%]*	n	f [%]**	n	f [%]**
IPCD aimed at city	13	54,2	7	53,8	6	46,2
IPCD aimed at centre	2	8,3	1	50,0	1	50,0
IPCD aimed at quarters	9	37,5	6	66,7	3	33,3
total	24	100,0	14	58,3	10	41,7
examples of comments in documents			– reference to impacts of past hazards – brief note within SWOT analyses		– reference to impacts of past hazards – comments on present and future risks – detailed comments on mitigation measures – environmental education	

Source: analyses of public documents from 12 regional centres available in 2012 except Prague (Praha) and Central Bohemia. IPCD – Integrated Plan of City Development (see text for explanation).

3. The social perception of natural risk: the case study of the city of Ústí nad Labem

The efficiency with which the conceptual shifts in disaster studies reach territorial planning efforts and natural risk management is influenced by the social notion of natural risks from both the country-wide and community perspectives (cf. Klimeš, Blahůt 2012). Regarding the social perception of natural risks, the Special Eurobarometer survey No. 365 carried out in 2011 offers the results on the perception of the environment across the member states of the European Union, including the issue of natural hazards (Eurobarometer 2011; see also Dostál 2010 for a discussion). When discussing the environment, 26% of respondents think of natural disasters (question QB2T), which is the same number as in Czechia. In both all EU states and in Czechia, however, natural disasters were listed last, after protecting nature, climate change, man-made disasters, and the quality of life. In total, 31% of EU citizens listed natural disasters as an issue they are worried about (question QB3) compared to 34% in Czechia. However, these results give only a general view. Moreover, the survey is not able to convey the complexity of the social notion of natural disasters. That is because the answers to questions aimed directly at the subjective perception of natural disasters reflect intellectual insight into the problem during the survey but not the realistic behaviour of respondents during and between the individual disaster events, as can be seen from field observations and as tested by the assessment of indirect indices. Therefore, it was necessary to complement the general survey with a more detailed case study using combined quantitative and qualitative methodologies. In this chapter, we present the analysis of the public perception of natural risks and the short-term and long-term effects of natural risks on social systems. The analysis was carried out in a case study of the city of Ústí nad Labem.

3.1 Natural risks in Ústí nad Labem

The city of Ústí nad Labem (population of 93,747 in 2013) is located at the confluence of the Labe River and Bílina River in N Czechia (Figure 1). With its annual discharge of 308 $m^3 s^{-1}$ at the country border in Hřensko, the Labe River is the largest river in Czechia with many documented historical flood events since the 19th Century (Figure 2; Table 3). These flood events had immense impacts on the local society functioning and on infrastructure because the whole city centre spreads within the deep valley bottom in the flooding area. The high-gradient tributaries of the Labe and Bílina Rivers suffer from flash floods, the impacts of which have resulted in further modification of the channels of these streams including protection dams. At the same time, the steep slopes built by different lithological units and exceeding 30° have been exposed due to the evolution of the Labe River valley, and these slopes are highly prone to various types of mass movements. The historical records of landslides and rock fall events within the city have been analysed by Raška et al. (2013). Finally, the peripheral sites of the city located at higher elevations are exposed to meteorological extremes, such as rainstorms and windstorms.

Fig. 2 Photos of historical spring flood in the city of Ústí nad Labem in 1920 (A) and summer flash flood in present-day city quarter Brná nad Labem in 1925 (B). Source: Archive of the Museum of the Ústí nad Labem city.

Tab. 3 The flood events at the Labe River in Ústí nad Labem in the 20th Century.

Flood magnitude [Q recurrence – approximate water level]	Year
Q_{100} – 1150 cm	2002
Q_{50} – 1080 cm	1845
Q_{20} – 980 cm	1862, 1890, 2013*
Q_{10} – 910 cm	1920, 1940
Q_5 – 820 cm	1923, 1941, 2006
Q_2 – 690 cm	1926, 1947, 1954, 1981, 1988, 2003

Based on the database of Povodí Ohře and Povodí Labe companies.
*current flood from June 2013, culmination at 1071 cm

During the last two decades, the city of Ústí nad Labem has been affected by several natural hazards, which are summarized in Table 4. These natural hazards included floods, flash floods, windstorms and landslides affecting both the inner city and the city periphery (Balej et al. 2007; Raška et al. 2011), but the fundamental impacts in terms of the complex character and spatial extent of the hazard have been caused by floods mainly in 2002 and 2006. Therefore, the following analyses will be primarily devoted to the short-term and long-term impacts of flood events in the city of Ústí nad Labem. The short-term impacts/effects are understood as those apparent during the disaster event or explicitly related to the event, while the long-term impacts/effects denotes the processes between individual disaster events and after them.

3.2 Short-term impacts and social perception of selected natural risks

The impacts of natural hazards in the city of Ústí nad Labem during the last two decades affected both the local communities and infrastructures. Moreover, the indirect effects of the natural risks were also apparent in city quarters, which are quite far from flood risk zones or sites of landslides, because the changes in the flow of traffic during the times of floods and other hazards resulted in the decreased accessibility of local communities to jobs and services among other effects.

The short-term effects of natural risks are well represented by changes in the local mobility of communities within the city and by the subsequent changes in the daily rhythm of localities. The issue of daily mobility has been discussed by Ellegård (1999) as an apt representation of the complex time-geographical approach to the study of the behaviour of people in concrete environments. Our assumption was that the daily mobility and rhythm of localities differentiates distinctly during anomalous events, such as natural disaster events. The daily rhythm has been analysed via repeated field survey at these sites during the flood events in 2002, 2006 and 2010. The assessment was then based on the qualitative assessment of observations and of collected photographic material according to the methods of visual sociology (Sztompka 2007), and supplemented by analysis of the Flood Protection Plan (Klenerová et al. 2004). The results of analyses of the daily rhythm at selected localities before, during and after the flood events in the city of Ústí nad Labem is shown in the Figure 3.

The major factor that influences the mobility of communities is concerned with determination of alternative corridors of mobility in areas that are not affected by floods. During the flood in 2002, the water level reached parts of the city quarters of Střekov, Ústí nad Labem – centre, Krásné Březno, Neštěmice, and Vaňov a Svádov including important traffic connections (Figure 4 for map). In turn, an alternative net of traffic lines evolved, which also included the connections that are usually not used (sidewalk across the railroad bridge). The bus traffic

Tab. 4 Major natural hazards and their impacts in Ústí nad Labem between 1990 and 2013.

Year	Type of natural hazard	Affected locality	Impacts, consequences
1994	landslide	Skalka residential zone	threat to buildings and roads
1995	landslide	Vaňov quarter	threat to buildings and roads; construction of retaining wall
2002	flood	city centre, Střekov	damage to roads and buildings, complex social impacts, limits to town traffic, indirect economic losses
2006	flood	city centre, Střekov	damage to roads and buildings, complex social impacts, limits to town traffic, indirect economic losses; completion of flood protection wall for Q_{20}
2007	windstorm (Kyrill)	higher-elevation sites	damage to forest sites; wood harvest, revegetation
2007	collapse of retaining wall (due to slope instability)	Větruše chateaux	destruction of viewpoint terrace, potential threat to visitors
2008	windstorm (Emma)	higher-elevation sites	damage to forest sites; wood harvest, revegetation
2010	flood, flash floods	city centre, Labe River tributaries	destruction of local hydrotechnical features, local limits to town traffic
2013	flood (concurrent)	city centre, Střekov	damage to roads and buildings, complex social impacts, limits to town traffic, indirect economic losses

The impacts and consequences according to town government reports, reports on city environment (Collective 2012) and rectified by own field survey.

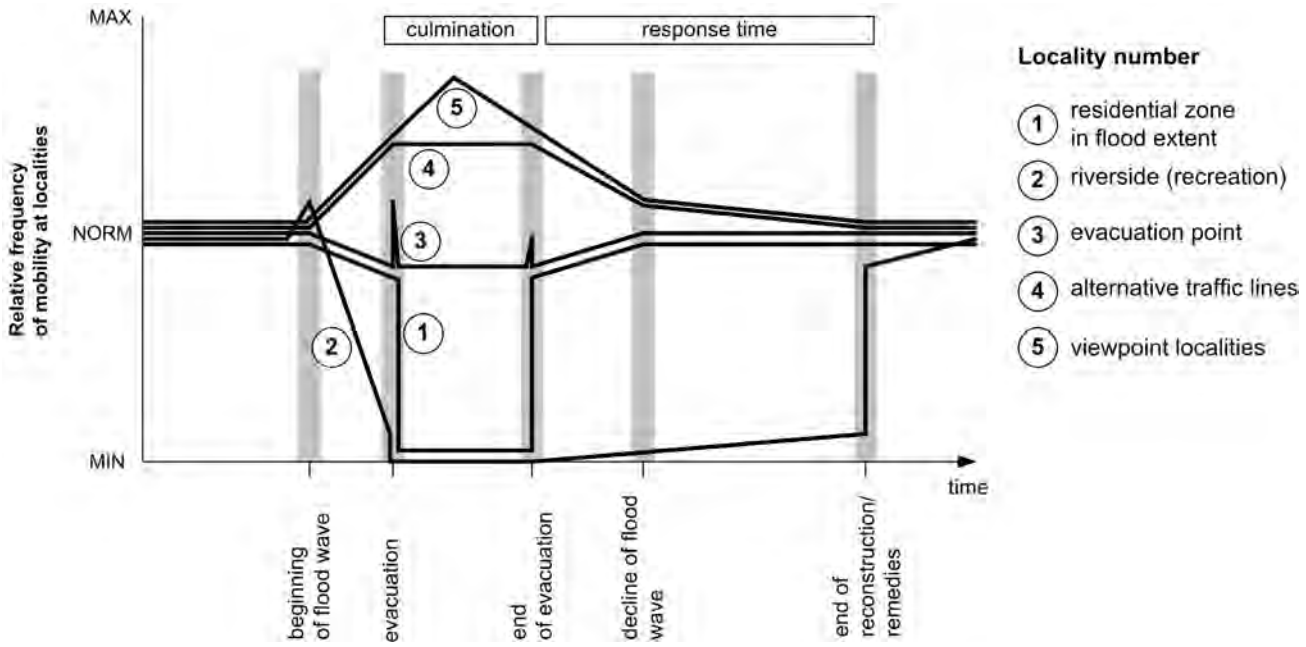

Fig. 3 Schematic representation of mobility rhythms at selected localities of Ústí nad Labem before, during and after the flood event. Based on field observation during the floods of 2002, 2006 and 2010, analyses of Flood Protection Plan and of changes in town traffic lines during the flood events. The vertical axis represents the relative change in frequency of daily mobility from the average (NORM) to the increased (towards MAX) and decreased (towards MIN) state.

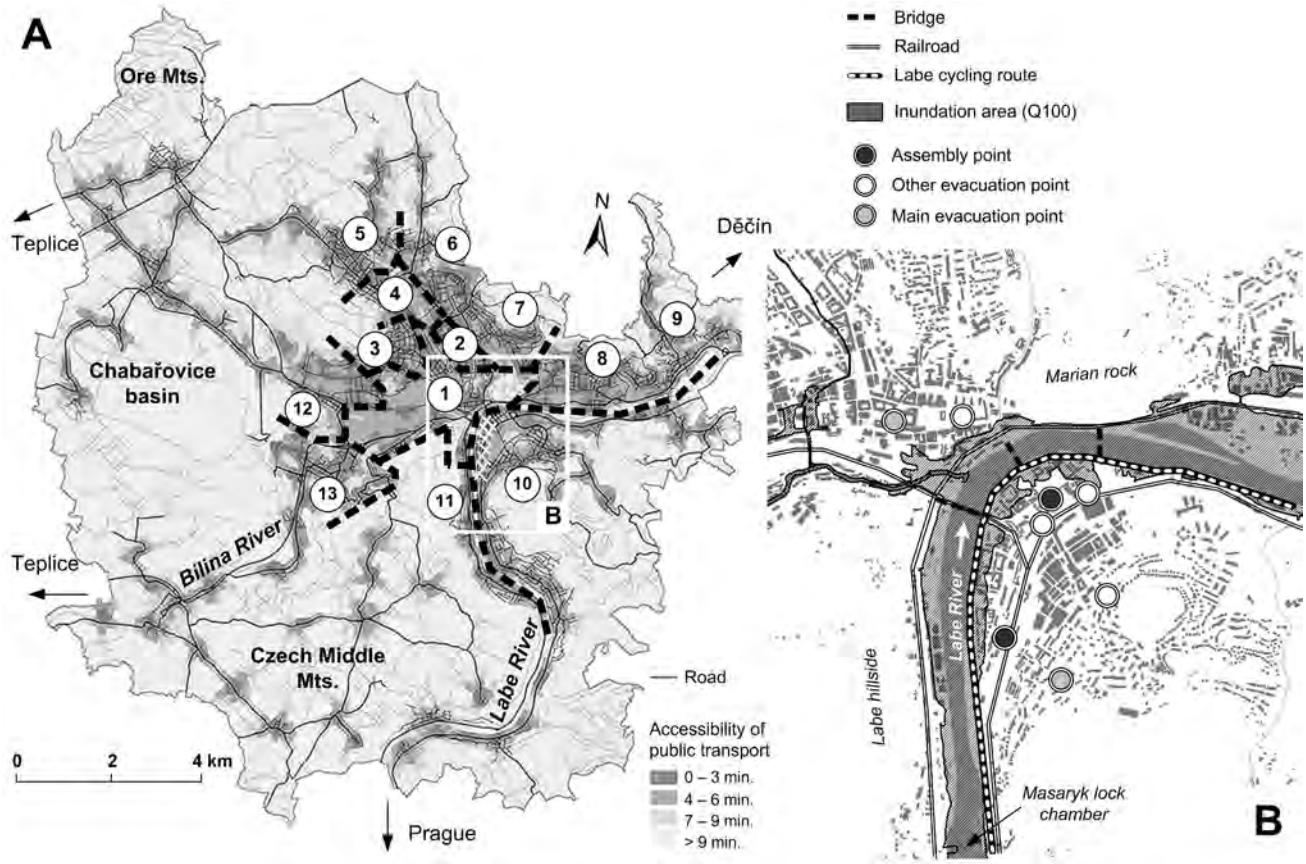

Fig. 4 A Location of city quarters in Ústí nad Labem: 1 – Centre, 2 – Skřivánek, 3 – Klíše, 4 – Bukov, 5 – Všebořice, 6 – Severní Terasa, 7 – Dobětice, 8 – Krásné Březno, 9 – Neštěmice, 10 – Střekov, 11 – Vaňov, 12 – Předlice, 13 – Trmice (the quarter of the Ústí nad Labem city before 1994). B Detailed map of the flood risk zone along the Labe River. Time accessibility to public transport published in Bartoš (2009).

lines increased their capacity in the peripheral quarters of the city, which also resulted in the increased use of services in these areas. This increased use of services together with the short-term accommodation of those who had been evacuated from their homes was negatively perceived by locals in some cases. On the other hand, even some inhabitants of flooded areas must have been frequently forced to evacuation as they did not want to leave their homes because of (a) low trust in protection of their property during the looting and (b) low confidence in seriousness of situation, which can be ascribed to uncertainty of forecast service and experts (cf. Sjöberg 1999).

The short-term increase in frequency of mobility was also characteristic for the assembly and evacuation points (Figure 4B) before the culmination of the flood wave and after its decline. The most significant changes in daily mobility have been logically identified in areas directly affected by floods (Figure 4B) and for those being evacuated or restricted for mobility. The characteristic feature of the daily mobility during the flood events is the "flood tourism" at the viewpoint sites. Along with the change of rhythm at different localities and corridors, we can also perceive differences in fluency of these changes and in the length of response time after the flood events (Figure 3). The complexity of changes in the daily rhythms and mobility of local communities indicates the increase of social notion of natural risks in a short-term horizon.

These results have also been confirmed with our previous questionnaire survey performed in 2008 (n = 108, face-to-face survey; see Raška et al. 2011 for detailed methodology). The questionnaire consisted of basic identification questions (sex, age category, education, address) and eight questions devoted to (a) the perception of relative importance of natural hazards, (b) the individual experience with the social impacts of natural hazards, and (c) effectiveness of warning system and sufficiency of information about the natural hazards. The survey indicated that certain differences exist in the perception of risk caused by various natural risks in different city quarters. Within the survey, the city was divided into five segments. Figure 5 reveals the answers for two questions within the survey that represented the most significant factors of territorial differences of natural risk perception. We assumed that the answers would be highly influenced by individual experiences during the disaster events (Kates 1976; see Bubeck et al. 2012 for a critical discussion) as only the inhabitants that have experienced at least the 2006 flood have been interviewed. The first question was aimed at satisfaction with public information about the disaster during the event. The answers indicate that the lowest satisfaction with the quality and frequency of information about the event is typically in areas that are highly exposed to the natural hazards. Secondly, we asked about perception of risk caused by different hazard types. The results are highly variable, and contrarily to similar studies from abroad (e.g., Brilly, Polic 2005) it is not possible to find clear territorial correlation between the answers and typical hazards in individual city quarters. According to our analyses, we suggest two reasons for these results. First, the local communities ascribe more than one hazard to their city quarter because these hazards have causal relations and the locals are affected by all of them directly or indirectly. Second, although the respondents may feel risk caused only by certain types of hazards, their general view of disaster risk reduction is based upon presumption that the mitigation measures must be complex and aimed at all types of natural hazards (cf. Placer and Delquié 1999). Moreover, the perception of insufficient information about the flood risk management points out the necessity for extended public flood communication campaign (Parker, Handmer 1998; Parker et al. 2009).

3.3 Long-term impacts and social perception of natural risks

While the short-term effects of natural risks are an important factor in increasing the social perception regarding natural risks, the question arises as to whether the natural risks are perceived with the same intensity over a long-term period, i.e., also during the periods

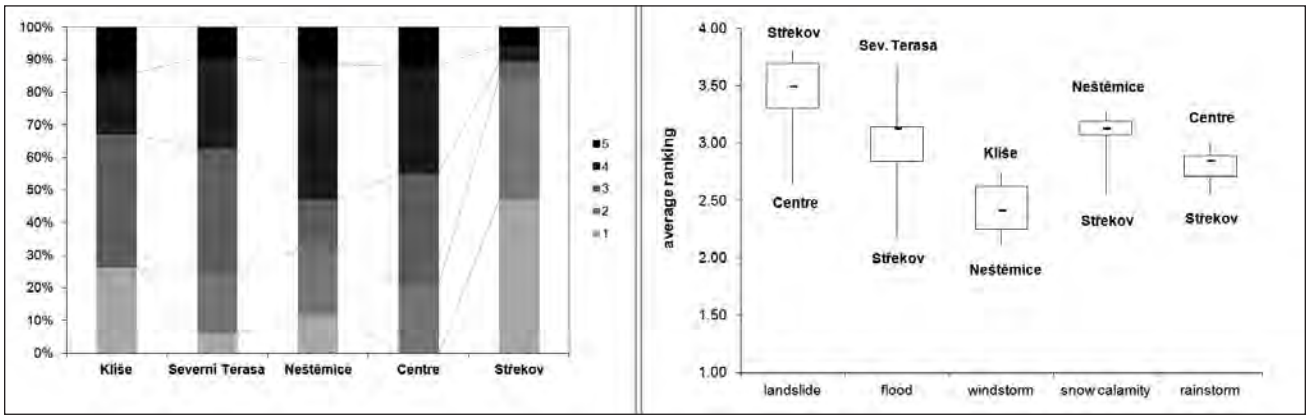

Fig. 5 Results of questionnaire survey. Left – Satisfaction with public information during the disaster events: 1 – minimum, 5 – maximum. Right – Average rank of the natural hazard according to level of risk: 1. – highest risk, 5. – lowest risk. Source: own survey, n = 108 (Raška et al. 2011). The city segments as follows: Klíše (incl. Klíše, Všebořice, Bukov), Severní Terasa (incl. Severní Terasa, Dobětice), Neštěmice (incl. Neštěmice, Krásné Březno), Město (incl. Ústí nad Labem – centre, Vaňov, Předlice), Střekov (incl. Střekov, Brná nad Labem).

Tab. 5 Statistical characteristics of the database of real estate (flats) in the Ústí nad Labem city in 2011.

	1 + k and 1 + 1	2 + k and 2 + 1	3 + k and 3 + 1	≥ 4 + k and 4 + 1	total
number of flats	19	89	62	19	189
minimal price [t. Kč]	295	419	570	450	295
maximal price [t. Kč]	1 039	1 792	2 462	2 904	2 904
average price [t. Kč]	605	878	1 320	2 049	1 113

Source: own survey from the http://sreality.cz website. Note to size categories – number stands for number of rooms + kitchen, k stands for kitchen corner.

Tab. 6 Analysis of variance for the database of two size categories of flats in Ústí nad Labem in 2011.

	n	s	min. [t. Kč]	max. [t. Kč]	F	p
2 + k and 2 + 1	89	281.23	419.00	1 792.00	3.365	0.003
3 + k and 3 + 1	62	376.38	570.00	2 462.00	2.861	0.010

The results are significant at $p < 0.05$. Source: own survey from the http://sreality.cz website. Note to size categories – number stands for number of rooms + kitchen, k stands for kitchen corner.

between individual disaster events. The short-term effects and social perception of natural risks are based more upon the direct evidence and experience with disasters, but the long-term social perception of natural disasters necessitates a more general and consistent intellectual insight of the local communities into the issue. Such consistent insight can be assessed through the analysis of factors other than questionnaires. Among the indicators of the long-term effects of the social perception of natural risks, the urban housing markets deserve the intense attention of both economists and environmentalists. The prices of real estate are influenced by a complex set of factors, including environmental factors (e.g., natural values and natural risks), location factors (e.g., accessibility), political and social setting (e.g., safety, social stratification, and cultural milieu) and economic factors (e.g., job opportunities and services). The significant decrease of real estate prices due to natural risks has been demonstrated with different locations. According to these studies, the decrease in price may range from less than 5% to almost 20% in floodplain locations (e.g., Hallstrom and Smith 2005; Bin et al. 2008). While some of the studies suggest only a temporary effect on real estate prices (Eves 2002; Lamond and Proverbs 2006), others indicate that the effect may be apparent for several years. The natural risks influence the price both directly, through potential social impacts and expenses for reconstruction of the house/flat after the disaster, and indirectly, through the insurance policies (e.g., Kousky 2011). To evaluate the impact of flood events in Ústí nad Labem on the long-term social perception of the natural risks, the quantitative assessment of the price of the real estate map was carried out. We performed the analysis for the year 2011, which is directly after the last flood event in 2010, and it covers the period of possible immediate impacts on the real estate map. The survey was aimed at prices of flats in similar categories of houses and with similar legal state (personal ownership) in the entire city of Ústí nad Labem. In the event that there was a flat offered by more than one real estate agency, only the lowest price was considered. After the reduction of double records, the dataset contained 189 items (flats) in four size categories (Table 5).

The statistical analysis of variance was only possible for the size categories of two-room (n = 89) and three-room (n = 62) flats because the number of flats in other categories was not adequately representative. However, the two-room and three-room flats constitute the dominant market component. The analysis indicates that there exists statistically significant differences in the prices of flats among the city quarters at the probability level of $p < 0.05$ (Table 6).

Although such differences in prices exist, there is no coincidence between the lower prices and risk-exposed areas and vice versa (Figure 6). These results also partly agree with the above mentioned results of the questionnaire survey. The streets located next to the right riverbank (Střekov in the Figure 4), for instance, which were flooded up to the first floor of houses during the 2002 floods and from which the inhabitants were evacuated, represent one of the most expensive locations after the city centre and Klíše residential quarter. The results for the riverbank may be partly influenced by completion of a flood protection wall in 2008; however, the wall is designed only for Q_{20} floods, while the 2002 flood had a magnitude of Q_{100}. The highest prices were found in the city centre, despite of its partial location within the annual flooding zone. According to these results, it seems that natural risks represent only a supplementary factor for the real estate market, and the social perception of natural risks is time-dependent with a decreasing importance during the periods between individual disaster events. The real estate market, as one of the factors/

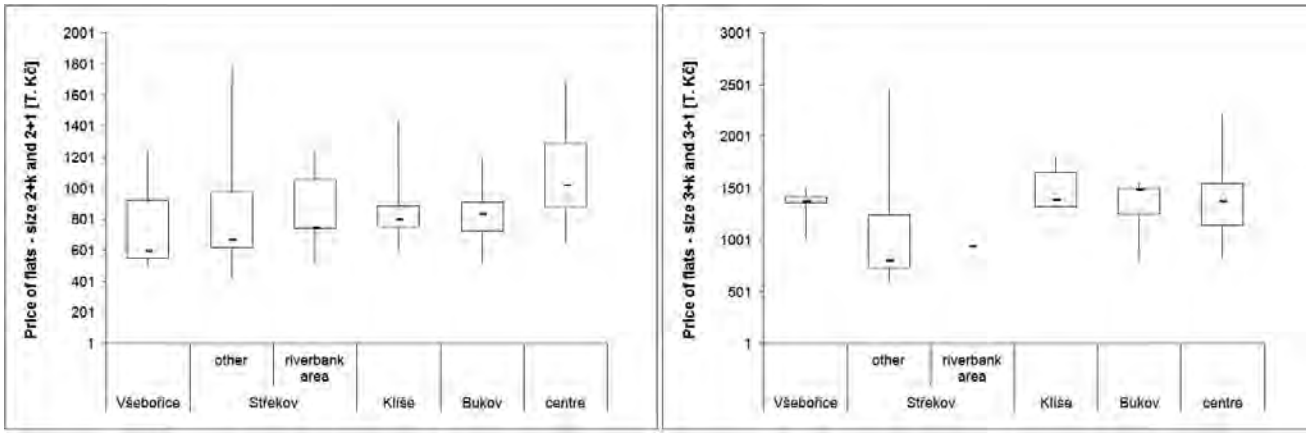

Fig. 6 Variability in the price of flats across selected city quarters. Source: own survey from the http://sreality.cz website. Note to size categories – number stands for number of rooms, k stands for kitchen. The location of city quarters is in Fig. 4.

representations of intra-urban mobility in the city of Ústí nad Labem, is generally more consistently influenced by stable long-term factors, such as job opportunities and the social structure of the city quarter (cf. Quigley and Weinberg 1977; Greenwood 1985) and by selected long-term environmental factors, such as the extent of green spaces and the level of air pollution in different parts of the city (Anděl 1999; Šašek 2008).

Although it would require further statistical analysis of the data regarding population migration within the city, the environmental intra-urban migration induced by the preference of localities due to natural risks (as discussed by e.g., Hogan a Marandola Jr. 2007; Stojanov et al. 2008) seems to be less important in Ústí nad Labem. This is partly consistent with the sociologic surveys stating that natural disasters constitute only a partial, if not minor, issue concerned with the social perception of the environment (Eurobarometer 2011). In this respect, environmental issues are more often perceived as the problems of the protection of nature, global issues, the quality of life or technological hazards. Frič (1996), for instance, has shown that, when talking about ecological disasters, most people in Czechia think of technological hazards concerned with the industrial sector. However, these results must be put in the context of the societal transition in Czechia during the last two decades. The 1990s are characterised as the beginning of the period of societal transition in Czechia, which also represents the beginning of the shift toward a post-materialistic value orientation *sensu* Dostál (2010). In that time, the environmental quality was not an important factor for 24–29% of the population of cities with more than 10,000 inhabitants, although it was generally an important factor at the national level (Drbohlav 1990). The shift toward environmental values was mostly apparent among the older population living in smaller cities and in the countryside. During the following two decades, i.e., between 1990 and 2010, there was a significant increase in positive attitudes towards the environment in Czechia, however, indicating the convergence of Czechia with other Central-European countries (Hadler and Wohlkönig 2012). Moreover, environmental values have been increasingly perceived as important among the young population in larger cities.

4. Conclusions

The aim of this paper was to discuss the effectiveness with which the recent progress in disaster risk reduction, highlighting the role of vulnerability assessment, has been implemented in Czechia. The analysis has been performed at two territorial levels.

First, we have evaluated the political regulations in natural risk issues and vulnerability strategies through the content and discoursive analysis of the international and national strategic documents and legal frameworks. The analysis has shown that the issue of natural risks is well incorporated into the strategic documents and legal frameworks in Czechia; however, these documents do not sufficiently reflect the global and European agreement on the necessity of a conceptual shift towards a social vulnerability concept within disaster risk reduction. Natural risks represent a stable but minor issue, which is mentioned within the strategic goals of the regional development of regional centres in Czechia as defined in the Integrated Plans of City Development (IPCD). However, similar to the national level documents and legal frameworks, the IPCDs do not develop the strategic tools for vulnerability assessment and mitigation.

Second, considering that the risk society concept is gaining increased attention in the recent theoretical discourse (Giddens 1999) and the notion that an effective disaster risk reduction must be based on community strategies (Innocenti, Albrito 2011), we have assessed the social perception of natural risks in the case study of the city of Ústí nad Labem, one of the major regional centres in Czechia affected by varying natural hazard types during the last two decades. The field observations showed the complex modification of the daily rhythms of the urban population during the individual hazard

events (mainly floods). The questionnaire survey indicated that natural risks are perceived as an important issue by the public, but the respondents perceive insufficiency of information about the risk management during the disaster events. At the same time, the weak territorial correlation between the hazards perceived as the most threatening by respondents in different quarters of the city indicates that the citizens may perceive the necessity for a complex strategy in disaster risk reduction.

While the short-term effects of natural hazards (disasters) on the daily rhythm of local communities and the social perception of these hazards is clear, the long-term effects are rather ambiguous. The social and economic impacts of past floods in the city of Ústí nad Labem have resulted in the creation of a digital flood plain corresponding to the nation-wide strategies of flood risk mitigation. Nevertheless, our analysis aimed at the real estate market, which is recently considered one of the important indicators of the social perception of natural risks, indicated that there is a very limited coincidence between zones with low prices and those with a higher level of natural risks. The prices of real estate and preferences toward certain city quarters seem to be considerably more influenced by economic factors and the complex environmental perception of quarters. The increasing environmental awareness in Czechia documented by recent sociologic surveys is more related to the perception of global issues, the quality of life and technological hazards, whereas the notion of natural risk represents only a supplementary segment of the attitude towards the environment. To conclude, the long-term perception of natural risks in the studied urban centre, i.e., the notion of risk during the periods between the individual hazards and after them, is relatively weak, which may represent a significant constraint for the implementation of community strategies of disaster risk reduction.

ACKNOWLEDGEMENTS

This research was supported by project No. 13-02080P "Documentary data sources for research of social perception and adaptation strategies to selected historic natural hazards in the Czech Republic" (Grant Agency of the Czech Republic) and project "Reference framework of documentary proxies for research and practical applications of problems of geomorphologic hazards" (IGA UJEP). The author would like to thank to Petr Dostál for his inspiring discussion on the risk society concept and to Martin Balej for his comments on statistical methods.

REFERENCES

ALCÁNTARA-AYALA, I. (2008): On the historical account of disastrous landslides in Mexico: the challenge of risk management and disaster prevention. Advances in Geosciences 14: 159–164, DOI: 10.5194/adgeo-14-159-2008.

ALCÁNTARA-AYALA, I., GOUDIE, A. S. (2010): Geomorphological hazards and disaster prevention. Cambridge, Cambridge University Press.

ANDĚL, J. et al. (1999): Geografie města Ústí nad Labem. Ústí nad Labem, Acta Universitatis Purkynianae UJEP.

BALEJ, M., ANDĚL, J., ORŠULÁK, T. (2007): Environmental stressors and stress as a natural/human interdisciplinary issue (case study from the Northwestern part of the "Sudetenland"). Acta Universitatis Carolinae, Geographica, 42(1–2), 53–74.

BARTOŠ, J. (2009): Časová dostupnost zastávek MHD na Ústecku. Diploma thesis, MS, Ústí nad Labem, UJEP.

BECK, U. (1992): Risk society: towards a new modernity. London, Sage.

BERNSTEIN, P. L. (1996): Against the Gods: the remarkable story of risk. New York, Wiley.

BIN, O., KRUSE, J., LANDRY, C. (2008): Flood hazards, insurance rates and amenities: Evidence from the coastal housing market. Journal of Risk and Insurance 75, 63–82, DOI: 10.1111/j.1539-6975.2007.00248.x.

BLAHŮT, J., KLIMEŠ, J. (2011): Příspěvek k české terminologii rizik ve studiu rizik ze svahových deformací. Geografie 116, 79–90.

BREAKWELL, G. M. (2001): Mental models and social representations of hazards: the significance of identity processes. Journal of Risk Research 4: 341–351, DOI: 10.1080/13669870110062730.

BRUEN, M., GEBRE, F. A. (2001): Worldwide public perception of flood risk in urban areas and it´s consequences for hydrological design in Ireland. Flood Risk Management Proc. Irish National Hydrology Seminar, Tullamore, November 2001.

BUBECK, P., BOTZEN, W. J. W., AERTS, J. C. J. H. (2012): A review of risk perceptions and other factors that influence flood mitigation behavior. Risk Analysis 32(9): 1481–1495, DOI: 10.1111/j.1539-6924.2011.01783.x.

ČAMROVÁ, L. (2006): Jak hodnotit efektivnost veřejných výdajů na povodně? Vodní hospodářství 9, 316–318.

CARDONA, O. D. (2008): The need for rethinking the concepts of vulnerability and risk from a holistic perspective: a necessary review and criticism for effective risk management. In: BANKOFF, G., FRERKS, G., HILHORST, D. (eds.): Mapping vulnerability: disasters, development & people (37–51). London, Earthscan.

BRILLY, M., POLIC, M. (2005): Public perception of flood risks, flood forecasting and mitigation. Natural Hazards and Earth System Sciences 5: 345–355, 1684-9981/nhess/2005-5-345.

CHOULARTON, R. (2001): Complex learning: organizational learning from disasters. Safety Studies 39(1–2):61–70, DOI: 10.1016/S0925-7535(01)00026-1.

CORBACIOGLU, S., KAPUCU, N. (2006): Organisational learning and selfadaptation in dynamic disaster environments. Disasters 30(2): 212–233, DOI: 10.1111/j.0361.3666.2006.00316.x.

COLLECTIVE (2000): Strategie ochrany před povodněmi pro území České republiky. Praktická příručka 35. Praha, MZE ČR.

COLLECTIVE (2010): Zásady urbánní politiky. Praha, MMR ČR.

COLLECTIVE (2012): Ročenka životního prostředí města Ústí nad Labem. Ústí nad Labem, MMUNL.

CRED (2009): The International Disaster Databse. Centre for Research of Epidemiology of Disasters. www.emdat.be

CUTTER, S. L. (1996): Vulnerability to environmental hazards. Progress in Human Geography 20(4): 529–539, DOI: 10.1177/030913259602000407.

DELICA-WILLISON, Z., WILLISON, R. (2008) Vulnerability reduction: a task for the vulnerable people themselves. In:

BANKOFF, G., FRERKS, G., HILHORST, D. (eds.): Mapping vulnerability: disasters, development & people (145–158). London, Earthscan.

DOSTÁL, P. (2005): Socio-geographical systems, institutional mechanisms and risk processes. Acta Universitatis Carolinae – Geographica 40, 5–23.

DOSTÁL, P. (2008): Changing geographical systems and risk processes: gerenal considerations. In: DOSTÁL, P. (ed.): Evolution of geographical systems and risk processes in the global context (15–36). Praha, Charles University, P3K.

DOSTÁL, P. (2010): Environment and regional cohesion in the enlarged European Union – differences in public opinion. In: ANDĚL, J., BIČÍK, I., DOSTÁL, P., LIPSKÝ, Z., SHAHNESHIN, S. G. (eds.): Landscape Modelling: Geographical Space, Transformation and Future Scenarios (59–77). New York, Springer.

DRBOHLAV, D. (1990): Důvody regionálních a sídelních preferencí obyvatelstva v ČSR. Sborník československé společnosti geografické 95, 13–29.

EC (2010): A Community approach on the prevention of natural and man-made disasters. European Community.

EC (2011): EU Strategy for supporting disaster risk reduction in developing countries 2011–2014. European Community.

EEA (2010): Mapping the impacts of natural hazards and technological accidents in Europe An overview of the last decade. EEA Technical Report No 13/2010. Copenhagen, European Environment Agency.

ELLEGÅRD, K. (1999): A time-geographical approach to the study of everyday life of individuals – a challenge of complexity? GeoJournal 48, 167–175.

EUROBAROMETER (2011): The Special Eurobarometer Survey 365. European Community.

EVES, C. (2002): The long-term impact of flooding on residential property values. Property Management 20, 214–227.

FALC, Z. (2001): Finanční pomoc státu při stabilizaci sesuvů v letech 1997–2001 v regionech postižených následky katastrofických povodní. Praha, MŽP ČR.

FLEMING, R. W., TAYLOR F. A. (1980) Estimating the costs of landslide damage in the United States. U.S. Geological Survey. Circular 832, 21 pp.

FRIČ, P. (1996): Postoje obyvatel ČR a SR k problému životního prostředí. Sociologický časopis 32, 353–360.

GIDDENS, A. (1999): Risk and Responsibility. Modern Law Review 62: 1–10, DOI: 10.1111/1468–2230.00188

GREENWOOD, M. J. (1985): Human migration: theory, models and empirical studies. Journal of Regional Science 25: 521–544, DOI: 10.1111/j.1467-9787.1985.tb00321.x.

HADLER, M., WOHLKÖNIG, P. (2012) Environmental Behaviours in the Czech Republic, Austria and Germany between 1993 and 2010: Macro-Level Trends and Individual-Level Determinants Compared. Sociologický časopis 48, 667–692.

HALLSTROM, D., SMITH, K. (2005): Market responses to hurricanes. Journal of Environmental Economics and Management 50: 541–561, DOI: 10.1016/j.jeem.2005.05.002.

HAMPL, M., DOSTÁL, P., DRBOHLAV, D. (2007): Social and Cultural Geography in the Czech Republic: under pressures of globalization and post-totalitarian transformation. Social & Cultural Geography 8(3): 475–493, DOI: 10.1080/14649360701489029.

HEWITT, K. (ed.) (1983). Interpretation of Calamity: From the Viewpoint of Human Ecology. Boston, Allen.

HOGAN, D. J., MARANDOLA, E. JR. (2007): Vulnerability to natural hazards in population-environmental studies. Background paper to the Population-Environment Research Network Cyberseminar on Population and Natural Hazards, 1–11.

HUFSCHMIDT, G. (2011): A comparative analysis of several vulnerability concepts. Natural Hazards 58: 621–643, DOI: 10.1007/s11069-011-9823-7.

INNOCENTI, D., ALBRITO, P. (2011): Reducing the risks posed by natural hazards and climate change: the need for a participatory dialogue between the scientific community and policy makers. Environmental Science & Policy 14:730–733, DOI: 10.1016/j.envsci.2010.12.010.

KATES, R. (1976): Experiencing the Environment as Hazard, In: PROSHANSKY, H. M., ITTELSON, W. H., RIVLIN, L. G. (eds.): Environmental Psychology (401–418). New York, Holt.

KLENEROVÁ, D. ET AL. (2004): Digitální povodňový plán města Ústí nad Labem [online]. Hydrosoft Veleslavín. Available at <http://www.usti-nad-labem.cz/dpp> [cit. 2012–02–13].

KLIMEŠ, J., BLAHŮT J. (2012): Landslide risk analysis and its application in regional planning: an example from the highlands of the Outer Western Carpathians, Czech Republic. Natural Hazards 64:1779–1803, DOI: 10.1007/s11069-012-0339-6.

KOUSKY, C. (2011): Managing Natural Catastrophe Risk: State Insurance Programs in the United States. Review of Environmental Economics and Policy 5: 153–171, DOI: 10.1093/reep/req020.

KREIMER, A., ARNOLD, M., CARLIN, A. (2003): Building safer cities, the future of disaster risk. Washington, World Bank.

LAMOND, J., PROVERBS, D. (2006): Does the price impact of flooding fade away? Structural survey 24: 363–377, DOI: 10.1108/02630800610711960.

MANUEL-NAVARRETE, D., PELLING, M., REDCLIFT, M. (2011): Critical adaptation to hurricanes in the Mexican Caribbean: Development visions, governance structures, and coping strategies. Global Environmental Change A 21: 249–258, DOI: 10.1016/j.gloenvcha.2010.09.009.

MUNICHRE (2009): TOPICS GEO Natural catastrophes 2009. Analyses, assessments, positions. Munich, MunichRe.

PARKER, D. J., HANDMER, J. W. (1998): The role of unofficial flood warning systems. Journal of Crisis and Contingencies Management 6(1):45–60, DOI: 10.1111/1468-5973.00067.

PARKER, D. J., PRIEST, S. J., TAPSELL, S. M. (2009): Understanding and enhancing the public's behavioural response to flood warning information. Meteorological Applications 16: 103–114, DOI: 10.1002/met.119.

PELLING, M. (2003): The vulnerability of cities. London, Earthscan.

PELLING, M., MANUEL-NAVERRETE, D. (2011): From Resilience to Transformation: Exploring the Adaptive Cycle in two Mexican Urban Centres. Ecology and Society 16, 11.

PLACER, V., DELQUIÉ, P. (1999): Measures of social risk perception and demand for risk reduction: an experimental comparison. Risk Decision and Policy 4, 129–144.

QUIGLEY, J. M., WEINBERG, D. H. (1977): Intra-Urban Residential Mobility: A Review and Synthesis. International Regional Science Review 2: 41–66, DOI: 10.1177/016001767700200104.

RAŠKA, P., DUBIŠAR, J., CHVÁTALOVÁ, A. (2011): Přírodní rizika města Ústí nad Labem: deterministický chaos či management krajiny. In: KOUTSKÝ, J. (ed.): Ústí nad Labem – město v mlze (168–185). Ústí nad Labem, Acta Universitatis Purky nianae UJEP.

RAŠKA, P., ANDĚL, J. (2012): Přírodní rizika ve městech jejich reflexe v rozvojových dokumentech. In: KOUTSKÝ, J., RAŠKA, P. (eds.): Výzkum regionálního rozvoje – vybrané přístupy a témata (115–132). Ústí nad Labem, UJEP.

RAŠKA, P., KLIMEŠ, J., DUBIŠAR, J. (2013): Using local archive sources to reconstruct historical landslide occurrence in selected

urban regions of the Czech Republic: examples from regions with different historical development. Land Degradation and Development, DOI: 10.1002/ldr.2192.
SAREWITZ, D., PIELKE, R. JR., KEYKHAH, M. (2003): Vulnerability and risk: some thoughts from a political and policy perspective. Risk Analysis 23: 805–810, DOI: 10.1111/1539-6924.00357.
SCHMIDT-THOMÉ, P. (ed.) (2006): Natural and Technological Hazards and Risks Affecting the Spatial Development of European Regions. Espoo: Geological Survey of Finland Special Paper 42.
SCHUSTER, R. L., HIGHLAND, L. M. (2001): Socioeconomic and environmental impacts of landslides in the western hemisphere. U.S. Geological Survey Open-File Report 2001-276.
SJÖBERG, L. (1999): Risk perception by the public and by experts: a dilemma in risk management. Research in Human Ecology 6(2), 1–9.
SLOVIC, P. (1987): Perception of risk. Science 236(4799): 280–285, DOI: 10.2307/1698637.
STEINBERG, T. (2000): Acts of God: The Unnatural History of Natural Disaster in America. Oxford University Press, Oxford.
STOJANOV, R., NOVOSÁK, J., OPINIANO, J. M., GEMENNE, F., SIWEK, T. (2008): Development, Environment and Migration. Analysis of Linkages and Consequences. Olomouc, Palacký University.
SZTOMPKA, P. (2007): Vizuální sociologie: fotografie jako výzkumná metoda. Slon, Praha.
ŠAŠEK, M. (2008): Zpráva z provedeného výzkumu „Zdravé město" pro MM Ústí nad Labem. Ústí nad Labem, UJEP.
UN (2005): The Hyogo Framework for Action. New York, United Nations.
UNDRO (1979): Natural disasters and vulnerability assessment. Report of expert group meeting. Geneva: Office of the UN Disaster Relief Coordinator.
UNISDR (2010): Making Cities Resilient. My City is Getting Ready. New York, UN.
VILÍMEK, V., SPILKOVÁ, J. (2009): Natural hazards and risks: the view from the junction of *natural* and social sciences. – Geografie–Sborník ČGS 114, 332–349.
WILKINSON, I. (2004): Suffering: a sociological introduction. Cambridge, Polity.
WISNER, B., BLAIKIE, P., CANNON, T., DAVIS, I. (2004): At risk: natural hazards, people's vulnerability, and disasters. London, Routledge.

Legal acts:
Act No. 114/1992 o ochraně přírody a krajiny.
Act No. 219/1999 o ozbrojených silách eské republiky.
Act No. 237/2000 o požární ochraně.
Act No. 239/2000 o integrovaném záchranném systému.
Act No. 240/2000 o krizovém řízení.
Act No. 241/2000 o hospodářských opatřeních pro krizové stavy.
Act No. 254/2001 o vodách.
Act No. 236/2002 o způsobu a rozsahu zpracovávání návrhu a stanovování záplavových území

Pavel Raška
Department of Geography
Faculty of Science, J. E. Purkyně University
České mládeže 8
400 96 Ústí nad Labem
Czech Republic
E-mail: pavel.raska@ujep.cz,
tel.: +420 475 283 300

RÉSUMÉ

Politická regulace a společenské vnímání přírodních rizik: „riziková společnost", česká zkušenost a evropský kontext

Důsledkem výrazných přírodních pohrom v posledních desetiletích začalo být stále více pozornosti věnováno společenské dimenzi přírodních rizik. Výzkumy sociální dimenze přírodních rizik v tomto ohledu přispěly k implementaci konceptu společenské zranitelnosti do mezinárodních právních rámců a strategií zmírňování přírodních rizik. V sociálně vědní perspektivě je efektivní cesta ke zmírňování škod způsobených přírodními pohromami spatřována ve společenské aktivitě (akci) realizované na různých institucionálních úrovních. Prvním cílem této studie je zhodnotit, do jaké míry česká politická reprezentace přijala a implementovala zmíněné legislativní rámce a strategie do národních a regionálních politik. Druhým cílem je pak analyzovat sociální odezvu na přírodní rizika v Česku a dokumentovat ji na případové studii města Ústí nad Labem. Politická deklarace přijetí konceptu přírodních rizik a koncepcí zmírňování zranitelnosti společnosti byla hodnocena na základě obsahové a kritické diskursivní analýzy strategických a legislativních dokumentů a rámců. Provedená analýza indikuje, že problematika přírodních rizik je do těchto dokumentů velmi dobře zakomponována, avšak dostatečně se v nich neodráží současný posun blíže ke konceptu sociální zranitelnosti, který je stále běžněji přijímán v Evropě a ve světě. Výsledky výzkumu sociální percepce přírodních rizik a terénní šetření v případové studii zaměřené na město Ústí nad Labem ukazují, že problematika přírodních rizik představuje významný krátkodobý rozhodovací faktor pro denní aktivity obyvatel města. Na druhou stranu, analýza dlouhodobé percepce přírodních rizik obyvateli města, provedená prostřednictvím analýzy cenové mapy nemovitostí po povodňové situaci, naznačila, že vnímání přírodních rizik mezi jednotlivými událostmi a po jejich odeznění je vcelku slabá. Tato skutečnost může představovat významnou bariéru v implementaci komunitních strategií zmírňování dopadů přírodních pohrom.