STATE AID FOLLOWING NATURAL DISASTERS

F. Řezáč, M. Řezáč, T. Nekovář

Received: February 7, 2011

Abstract


The article deals with state and regional actions taken to eliminate the effects of natural disasters. It focuses on clarifying the causes, extent and impact of flood damage in the years 1997–2010, not only in the Czech Republic but also in neighboring countries within each river basin crossing the border. The legislative framework is given by the European Union’s Directive on the assessment and management of flood risks. The directive is followed by the strategy of flood protection in the Czech Republic according to the specifications of the assets of the state, municipalities, citizens and businesses. Action plans for flood protection are then processed in accordance with individual river basins, the ones discussed in this article being the Elbe, Danube and Odra. A chronological summary of floods during the 1997–2010 period presents relevant data on these events, including comparisons with previous periods. In conclusion, the authors present data on the number of claims, the extent of the damage, and the total sum of insurance claims paid out by member associations of the Czech Insurance Association. It also deals with problems concerning the underestimation of insurance coverage, especially among small and medium-sized businesses.

With the democratization of market conditions in the Czech Republic, there has gradually arisen a division between central government and public administration, which has seen a gradual shifting of powers from central authorities to the regional level. Therefore at all levels of public administration there have been unprecedented increases in the importance and role of government in all spheres of society, especially in the areas of social and economic development and environmental protection.

In contrast, the development of a globalized world brings many problems with which the various structures of public administration must be able to cope. The significance of this administration has become clear especially in recent years, because of the growing number of insurance events, but mainly because of the large degree of damage caused by natural disasters to the lives and health of citizens, private property, corporations, municipalities, cities and the state. However, the insurance industry may also play a significant role in eliminating or at least mitigating the effects of natural disasters by providing insurance cover, which may help to reduce the effects of injury on the lives and health of citizens and to reconstruct or replace damaged or destroyed personal, municipal or state property.

The aim of the article is to analyse provisions of public administration and the insurance sector which attempt to ameliorate the consequences of natural disasters in river basins in the Czech Republic and adjacent areas in neighbouring states. It points to the importance of commercial insurance in safeguarding the health of citizens and protecting the property of citizens, corporations, public administrations and the state.

MATERIALS AND METHODS

Both a descriptive and an analytical approach are used when discussing the role of the state and regional authorities in taking strategic action and proposing measures to overcome the consequences of natural disasters. In the summary of insurance events from 1997 to 2010, listing damage costs and the impacts of floods in the respective regions, an analytical approach was used. The whole article uses data and forecasts processed by central and regional institutions by means of mathematical and statistical methods.

RESULTS AND DISCUSSION

Public authorities can be supported by state aid after natural and other disasters in accordance with legal regulations. The Ministry for Regional Development is preparing a draft recovery strategy based on documentation concerning the affected regions. This strategy will be used, after approval by the government, as the default framework document for the implementation of aid programs by individual ministries, in accordance with their authority.

1. European Union Directive on the assessment and management of flood risk


The purpose of this directive is to establish a framework for the assessment and management of flood risk in order to reduce the adverse effects on human health, the environment, cultural heritage and economic activity associated with floods in the European Union. For the purposes of this Directive, "flood" means the temporary covering of an area by water from a river, which is not usually flooded. This term includes floods caused by rivers, mountain torrents, ephemeral rivers in the Mediterranean and flooding from the sea in coastal areas; flooding caused by canalization systems is not included. "Flood risk" means a combination of the probability of flooding and the probability of the occurrence of adverse effects on human health, the environment, cultural heritage, economic activity and infrastructure associated with floods.

Floods can cause fatalities, the displacement of people and damage to the environment, seriously threatening the economic development of communities and undermining their economic activities. Floods are natural phenomena which cannot be prevented. Certain human activities (e.g. the expansion of settlements and economic areas in floodplains and the reduction of the soil's natural water due to land use) as well as climate change, however, increase the likelihood of flooding and its adverse effects. It is feasible and desirable to reduce the risk of the occurrence of adverse effects associated with flooding, especially on human health and life, the environment, cultural heritage, economic activity and infrastructure. However, if measures to reduce these risks are to be effective, they should be coordinated as much as possible throughout the basin.

2. The strategy of flood protection in the CR

In relation to previous European directives in the given area, The Strategy for Flood Protection in the Czech Republic 3 (approved by government resolution No. 382 of 19th April 2000) has been adopted in the Czech Republic. It includes issues relating to:
- flood protection strategy,
- forecasting and warning services,
- influencing the course and extent of flooding,
- limiting potential damage,
- the protection of property,
- implementation of the Strategy and related links.

One of the most important principles of the Strategy is the duty of each individual to adequately protect their property from flooding. As for the cost of this protection, act ČNR No. 130/1974 Coll., State administration in Water Management, as amended, provides that legal entities and natural persons shall bear the cost of measures to protect their own life and property; paid administrators of watercourses and waterworks owners or users shall bear the cost of safety work on watercourses. On the basis of the evaluation of the cost of repairing the damage after the floods of 1997, a deepening of the differentiation between approaches to protecting the assets of various entities is proposed. These principles are also embodied in a draft of the new Water Act.

State property

Administrations and legal entities managing state-owned property should provide reasonable protection of state property against flooding. The government should release funds to repair flood damage to state property, particularly damage to transport and telecommunications infrastructure, energy distribution networks, and river beds, and

---


ensure the continuance of necessary economic functions in the affected areas. State property may be insured against the risk of flood damage if it is required by the nature of the asset and if the cost of insurance over a long period does not exceed the estimated cost of flood damage.

**Municipal property**

Individual municipalities can take direct action to protect their built-up areas at their own expense. The state may contribute to these measures. Municipalities may request contributions towards the implementation of measures to restore educational and health facilities owned by municipalities or regions. In order to build sufficient financial reserves, the draft Water Act provides for the establishment of special accounts in the regional budgets, which will serve to meet the needs of preventive flood protection in the region's river basins. At the same time it provides for the creation of a fund to deal with flood damage. Funds from these accounts will be used for the implementation of preventive measures in river basins and the repair of flood damage.

**Property of natural persons and legal entities**

Legal and natural persons shall bear the costs they incur by their own actions in protecting their property against floods. **Movable and immovable property of citizens and businesses should be protected against serious flood damage by an insurance policy.** Market insurance products in the Czech Republic in the field of property insurance and liability insurance are sufficient.

From expert analysis provided by commercial insurance companies, it follows that there are no known or material obstructions or geographical areas in which the property of citizens would not be insurable against the risk of flood damage. **Discrimination against uninsured persons in favour of uninsured persons in the distribution of state aid and social benefits in the case of large natural disasters (such examples are the floods in 1997) is inadmissible.** These principles were contained in the Proposal for a System of Measures for the Reconstruction of Infrastructure After Flooding or other natural disasters, which was adopted by the Czech government in Resolution No. 721 of 14th July 1999.

To influence public attitudes, it is proposed to project the risk to flood affected areas in terms of understandable economic indicators. Such risk should, for example, and to a certain extent, influence the land market, especially with respect to construction, buildings and arable land. It is necessary to encourage owners to insure property and agricultural production at risk of flooding, for example, by making insurance premiums associated with flood risk tax deductible. The use of indirect economic incentives can increase the number of insurance contracts pertaining to the risk of flood damage to real property, especially to private housing, and thus indirectly increase cash reserves that can be used in cases of flood damage.

**Evaluating the impact of measures taken**

Improving strategic decision-making means evaluating the benefit of measures taken to reduce flood damage. For this purpose it is necessary to choose a means of determining and assessing flood damage in the long term, which provides information on the same level currently demanded in the European Union. It is therefore appropriate to base the statistical monitoring of flood damage on the basis of the geostatistical model supported by GIS technology.

Statistical information and the model will serve:

- to arrive at a prompt decision on the amount of specific material or financial support from the national reserve to be released in the case of catastrophic floods,
- to manage the recovery of areas after floods,
- to evaluate the effectiveness of measures taken.

The geostatistical model of flood damage, in combination with models of the passage of flood waves will be used to model potential flood risk (the destructiveness of floods), according to various design characteristics. In order to use this model to evaluate the economic efficiency of counter-measures, it is essential that the central authorities responsible for geostatistical information are entitled to demand information on insurance cases and the amount realized by claims resulting from property insurance against the risk of flood damage, and that insurance companies are obliged to hand over such information to state authorities. The content and detail of information involving this type of indemnification and the conditions for handing it over shall be determined by law. Amendment to act No. 363/1999 Coll., Insurance is therefore proposed.

The Ministry for Regional Development, under Ref: 21575/2009-52, made the decision to renew municipal and regional property affected by flood or other natural disaster in the form: **Policy Program for providing funding in 2009**. The objective is...
to contribute through subsidies from the budget of the Ministry for Regional Development towards the renewal of municipal and regional property damaged by flooding or other natural disaster that occurred in 2009. The beneficiaries of Grant Program No. 1 are municipalities, associations of municipalities, and regions (hereinafter referred to as a participant of the program) in which a state of danger or emergency was declared on account of a natural disaster. The beneficiaries of Grant Program No. 2 are municipalities, associations of municipalities and counties affected by natural or other disaster in which a state of danger or emergency was not declared. Support is provided in the form of investment and non-investment-based subsidies. An investment subsidy is for an investment project whose costs are associated with the acquisition of property or its replacement, in which the value of the property is appreciating, in some cases even with the cost of maintenance and repair of property if it is part of an investment project. A non-investment subsidy is for a non-investment project, whose costs are associated with the maintenance and repair of property, if the value of the property is not appreciating.

3. Action plans for flood protection

Flood protection is implemented according to each individual basin, even at international level. This was adopted by the following protocols:


In central Europe, the Elbe flows a length of 1094 km from its source in the Giant Mountains and empties into the North Sea near Cuxhaven. Its catchment area of 148,268 square kilometers includes the Danube (817 000 km²), Vistula (194,112 km²) and Rhine (183 800 km²). The Elbe River flows through four countries: the bulk of the river is located in Germany and the Czech Republic (65.4% and 33.8% of the river respectively); only 0.6% flows through Austria and 0.2% through Poland.


The River Danube is the second largest river basin in Europe, covers an area of 801,463 km² and extends to 18 states. The length of the Danube is 2780 km from west to east. Its catchment area stretches from 8 ° 09 ' from the sources of the rivers Brigach and Breg in the Black Forest Hills to a longitude of 29 ° 45 ' east in the Danube Delta, which opens into the Black Sea. The southernmost point of the Danube River basin is at a latitude of 42 ° 05 ' north in the headwaters of the river Iskar in the Rila Mountains, and the northernmost point is 50 ° 15 ' in the headwaters of the River Morava. The average flow of the Danube River reaches 6 550 m³/s at the mouth of the Danube delta. The Danube basin is bounded by the Rhine tributaries to the west, by the Jizera, Elbe, Odra and Visla rivers in the north, by the basins of the Dniester in the Northeast, and by the basins of rivers flowing into the Adriatic and Aegean Sea in the south. The watershed separating the Adriatic from the Danube river basin is Dinářský karst, which brings some uncertainty into the definition of the surface and subsurface boundary of the basin. A similar situation exists between the upper Rhine and Danube. Flooded conditions in adjacent basins are often very similar.

c) The International Commission for the Protection of the Odra River against Pollution adopted the Action program against flooding in the Odra river basin in Wroclaw in 2004.

The International Commission for the Protection of the Oder (MKOOpZ) have developed a common strategy and principles of flood protection to explore the possibilities and scope of prevention and protection against floods in the Oder and especially for the design of common objectives, which would allow in future:

- the faster and more accurate prediction of the development of flood events,
- the regulation of flood flows through retention and water retention in the catchment area and thereby reduce flood conditions,
- improvements in the protection of populated areas and
- the protection of water against pollution caused by flooding.

The flood on the Odra river (see Fig. 1) emphasized that flood control cannot end at national borders, but must be carried across borders. Only common preventive flood protection, agreed between states lying in the Oder basin, can help to prevent damage caused by floods and flooding in the future.

4. Comparison of major floods and deluges from 1997 to present

Due to the relatively high level of property insurance in the insurance market in the Czech
Republic, both commercial insurance companies and responsible local or national government bodies and public authorities have continuously and consistently addressed the problems, incidents and claims against damage associated with natural disasters. Insurance companies have a particular duty, which is the obligation to pay indemnity in the event of an insurance claim. This is required by the Insurance Act. The payment of indemnity by commercial insurance to the insured occurs under a variety of circumstances:
- for reasons of the reporting of accidental insurance claims,
- on the basis of a valid insurance contract concerning the selected insurance risks,
- after the documentation of claims, including physical inspections of damaged or destroyed items,
- after the investigation of insurance claims.

1: Odra river basin

2: Affected area in the region of Přerov

---

For illustration, we present a brief overview of major floods and deluges from 1997 to the present\(^\text{8}\), including a list of the affected areas, giving causes, numbers of fatalities and displaced persons, and the amount of damage.

**5th to 16th July 1997 – Oder and Morava**

The most tragic floods of the 20th century in the Czech Republic unexpectedly hit one third of the Czech Republic, mainly Moravia and eastern Bohemia. In the Morava and Odra river basins, over half the usual annual rainfall fell in just a few days.

**Affected areas**: southern Poland, western Slovakia and the eastern Czech Republic, (Oder, Visla, Moravia) – 536 towns and villages in 34 districts, for example, parts of Ostrava, Otrokovic, Přerov, Olomouc.

**Cause**: prolonged heavy rain.

**Number of victims**: Poland – 54; the Czech Republic – 50. In the Czech Republic, most of the victims drowned; some died from other causes. The floods had particularly tragic consequences for the village of Troubky, in the region of Přerov, where nine people died and only ruins remained.

**Number of evacuees**: Poland – 162,500; the Czech Republic – almost 80,000 (of which more than 10,000 remained without a roof over their heads).

**Damage**: Poland – $USD 1 billion; the Czech Republic – $USD 1.8 billion (about 63 billion CZK).

**23rd July 1998**

Torrential rain on the night of 23 July 1998 caused floods mainly in the district of Rychnov nad Kněžnou. The level of the most swollen rivers, the Bělá, Dědina and Zlatý potok, increased slightly to about three meters above normal.

**Affected area**: An area of approximately 100 square kilometers in eastern Bohemia in the districts Rychnov Kněžnou and Nachod. Thirty villages were flooded. The most affected municipality was Kounov; the water and tons of stones destroyed ten houses.

**Victims**: Six people drowned during the floods; an indirect victim – a volunteer rescue worker from Prague – died in a traffic accident.

**Number of evacuees**: A total of 800 people.

**Damage**: CZK 1.927 billion.

**7th to 17th August 2002**

The floods were one of the greatest natural disasters in the history of the Czech Republic. More than one third of the Czech Republic was affected, southern, central and northern Bohemia suffering the most. Moravia was also affected.

**Affected areas**: Austria (Danube, Salzach, Kamp), Germany (Danube, Elbe, Mulde), Slovakia, Poland, Hungary, Romania, the Czech Republic (Vltava, Blanice, Malše, Berounka, Úhlava, Lužnice, Otava, the Elbe, Szava). 800 villages, 260 bridges, over 30 sections of first class road, and over 150 lower-class roads were damaged. Overall, flooding occurred in ten regions. Mělník, in southern Bohemia, and Zálezlice, in central Bohemia, were partially destroyed.

**Cause**: two major cyclones with an associated frontal system over central Europe occurring in a short time interval – 2 waves of precipitation.

**Number of victims**: Central Europe – 55; the Czech Republic – 17. In the Czech Republic, ten people drowned.

**Number of evacuees**: 225,000, mostly in Prague.

**Damage**: U.S. $ 20 billion in Central Europe; CZK 73.1 billion in the Czech Republic. Prague reported the most damage (nearly 27 billion CZK).

**28th March to 10th April 2006**

Melting snow and intense rain caused floods in most rivers, including the Dyje, Morava, Labe and Ohře.
Areas affected: Germany (Labe, Rýn), Austria (Thaya, Dunaj, Inn, Traun, Enns, March), Slovakia (Dunaj, Myjava, Hron, Nitra, Törysa, Bodrog), Hungary (Dunaj, Tisza, Vah, Koros), the Czech Republic (Vltava, Labe, Dyje, Morava, Jihlava, Lužnice, Oskava, Jevišovka, Svatava, Svatka). The most affected areas included Jihočeský kraj (Veselí nad Lužnicí, Soběslav, Pláná nad Lužnicí, Třeboň), Středočeský kraj (Mělník, Zruč nad Sázavou), Ústecký kraj (Ústí nad Labem, Hřensko), Pardubický kraj (Cereckvice), Jihomoravský kraj (Znojmo, Jevišovka, Novosedly), Olomoucký kraj (Olomouc, Litovel), Zlínský kraj (ThuMačov), Královéhradecký kraj (Hradec Králové), and Vysočina (Třebíč). The last state of emergency was lifted on 10th April.

Cause: a sharp temperature rise associated with melting snow and heavy rainfall.

Number of victims: in Central Europe – 12 people; in the Czech Republic – 9 people (including two children; most of the victims drowned in swollen rivers).

Damage: U.S. $ 254 billion in Central Europe; 5.6 billion CZK in the Czech Republic.

24th June to early July 2009

The intensity of rain water in the Moravian region increased from 24th June; in early July floods affected seven regions.

Affected areas: successive floods hit the Moravian-Silesian region, Olomouc, the South Bohemia region, Zlín, the Hradec Králové Region, the Highlands, Ústí nad Labem and Liberec. The worst affected were Novojičínsko, Jesenice, Prachatice, Strakonice and Děčín.

Number of victims: 15 people; in northern and central Moravia 13 people; one of the dead was from Vysočina and one woman drowned in Ústecký kraj. Most of the victims – nine – were in the Nový Jičín region.

Number of evacuees: Several thousand people; firefighters rescued 226 people and evacuated 1851 people.

Damage: Over CZK 8,57 billions.

14th to 21st May 2010

First, due to persistent rain, river levels began to rise in the Moravian-Silesian region, gradually affecting other Moravian regions. Flooding lasted until 21st May, when the level of the Morava river in the eastern Moravian Lanžhot, Břeclav region dropped to a second level flood level. A major problem was soaked soil subsidence.

Affected areas: A large part of Moravia-Silesia and Olomouc, Zlín and the South Moravia region. The worst affected area was the Moravian-Silesia region. However, the floods also severely damaged, for example, the village of Troubky, in the Přerov district, which had become a symbol of the floods in 1997.

Number of victims: one.

2nd to 10th June 2010

Water from swollen streams after heavy rains again flooded parts of Moravia and Silesia. After the rain began to move to Bohemia, river levels increased in the Vysočina region, especially in Pardubice; rivers overflowed in Pilsen and the southern Region. The situation improved on 6th June, but on the 9th June torrential rains hit the northern part of Bohemia.

Affected areas: the third degree of flood activity (threat) applied in many places in the Moravian-Silesian region, Zlín, Olomouc, the southern Moravia region and the Vysočina region. The Zlín region was declared a state of danger; a state of danger was also declared in several places in the southern Moravia region and the Moravian-Silesian region.

Number of victims: five.

Representatives of commercial insurance companies marked the year 2010 as a year of calamities, which also came with iron regularity. First it was hurricane Daisy, which blanketed the Czech Republic with snow, followed by May’s big flood, followed by flash floods in August, which were followed by hailstorms a week later and finally by the St. Wenceslav's floods.

If the causes of damage are considered, half of all damage is caused by the weight of snow, snowslides, or ice, and the remaining half is divided roughly equally between hail, flood and heavy rain, which are associated with high winds and falling trees etc. If insurance claims from 2010 are added together, they almost reach the number of insurance claims arising from the floods in 2002. The damage caused by natural disasters in 2010 is five times higher than the damage caused by natural disasters in 2009.

5. Selected indicators of the insurance market – insurance coverage

As previously mentioned, insurance companies are obliged to inform the central authorities about the number of claims and the amount of indemnities paid under the indemnity arising from insurance contracts.

Current statistics from the Czech Insurance Association (ČAP) confirm that the elements now present a permanent level of risk to the Czech Republic, against which the Czech Republic must be well insured. In terms of the volume of damage caused by natural disasters, the year 2010 came in 3rd just after the years 2002 and 1997. During this year, a series of catastrophic weather events caused CZK 2 billion more damage than storms and floods in 2009. In the period from May to September 2010, a reported 63 thousand insurance claims were

---

9 Also see closer: ČEJKOVÁ, V.: Pojištění trh. 2002. p. 27.
submitted suggesting a total bill of more than CZK 5 billion. Damage from hailstones in Prague, alone, from a storm which lasted only a few minutes, was CZK 1.8 billion, this volume of damage exceeding damage from flood events which struck Moravia and northern Bohemia in 2010.

Floods in 2010 occurred four times in May and June throughout Moravia resulting in 18.5 thousand claims totalling CZK 1.7 billion. In August and September, floods repeatedly affected northern Bohemia. Insurance companies registered more than 12 thousand claims against damage totalling CZK 1.6 billion.

Insurance companies react very quickly to these situations and try to respond by speeding up the process of liquidation and the payment of insurance benefits. Claims arising from the May floods have been handled in 94% of cases, the June floods in 77% of cases, and the August floods in 63% of cases, with most of the settled claims accounting for damage to private property. The settlement of claims made by businesses requires more time and investigation. In the case of places affected twice in quick succession, insurance companies approached the second claim as if it were a new insurance event, and if it occurred during the reconstruction of property, provided, or additionally provide, their clients with full insurance coverage.

According to data from the Czech Insurance Association (ČAP), in 2009 claims expenses in the insurance market in the Czech Republic rose by 9.7%, of which the contribution from life insurance continued to fall, experiencing a decline in growth rate from 21.4% to 9.2%. Meanwhile, in the non-life insurance sector the rate increased from 6.5% to 10.0%. Each segment's share of the total costs of claims remained almost unchanged and amounted to 44.1% for life insurance and 55.9% for non-life insurance. In value terms, regarding the total sum of insurance payouts, there occurred a decline in performance from 12.4% to 9.3%, while all monitored items experienced growth. On this, even with lower growth, life insurance again contributed the most, with pension payouts growing by 14.0% against 5.4% in 2008. Other different kinds of life insurance reported a reduced performance from 22.3% to 10.7%. Car insurance handles a significant proportion of payouts – accident insurance and liability insurance of the vehicle. Claims expenses associated with insurance against acts of nature rose by 4%.

### SUMMARY

The adopted measures in the form of strategies to protect against floods in the Czech Republic, completed by the Action Plan for flood protection, particularly in the Elbe, Odra and Danube river basins, confirm the importance of the attention paid to the issue in question, both at the level of the European Union and at the level of the Czech Republic and its regions. In particular, the adopted measures are the focus of attention of the Ministry for Regional Development, the Ministry of the Environment and the Ministry of Finance, but also individual counties, towns and villages. The expenditure of funds from the state budget through grants and private funds through insurance are now running at billions of CZK a year and require considerable attention. It is not always possible to satisfy all applicants for grants. Unfortunately, in rare cases, there is also abuse of subsidies, these...
sometimes being used for purposes other than those related to the effects of floods and deluges or other natural events.

Even in the area of private insurance the desired state has not yet been reached, as not only individuals but also small and medium entrepreneurs still underestimate the importance of insuring people and property. Even large enterprises are subject to imbalances in insurance coverage, when part of the property is "over-insured" and part is "under-insured", or not insured at all. The fact cannot be ignored that a certain percentage of insured individuals or businesses have dwellings or manufacturing facilities located in flood zones and thus come into conflict with insurance companies that are, for such reasons, reluctant to pay out on insurance claims. At the same time, the long experience of insurance practice bears witness to the justness of insurance contracts in dealing with the consequences of natural disasters.

REFERENCES

LANGHAMMER, J., 2009: Typologie povodní, extrémní povodně v Evropě a ČR. Přednáška Povodně v krajině, PF UK v Praze.


Address
Ing. František Řezáč, Ph.D., Katedra financí, Masarykova univerzita, Lipová 41a, 602 00 Brno, Česká republika, Mgr. Martin Řezáč, Ph.D., Ústav matematiky a matematiky, Masarykova univerzita, Kotlářská 2, 611 37 Brno, Česká republika, Bc. Tomáš Nekovář, Katedra financí, Masarykova univerzita, Lipová 41a, 602 00 Brno, Česká republika, e-mail: rezac@econ.muni.cz, mrezac@math.muni.cz, 82732@mail.muni.cz