

THE PREVENTION OF FLOODS IN THE CZECH REPUBLIC

PREVENČE POVODNÍ NA ÚZEMÍ ČESKÉ REPUBLIKY

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Abstract

The outflow of almost all water from the hilly regions of the Czech Republic into neighbouring countries, from which no water comes to our country leads us to the signification as the „Roof of Europe“. The absolute dependency of our water resources on rainfalls causes, that in period of their fluctuation the water regime has to face the hydrologic extremes – floods and draught. This was reflected in activity of citizens and water managers in building dams and large ponds in order to catch the flood and afterwards to ensure water for period of draught.

Abstrakt

Odtok téměř veškerých vod s kopcovitého území České republiky do sousedních států, odkud k nám prakticky nic nepřitéká, vede k označení našeho území jako „střecha Evropy“. Absolutní závislost našich vodních zdrojů na atmosférických srážkách způsobuje, že v důsledku jejich rozkolísanosti je vodní režim vystaven hydrologickým extrémům – povodním a suchu. Tomu také odpovídala činnost vodohospodářů a obyvatel již historicky, kdy vznikaly přehradní nádrže a velké rybníky k zachycení povodně a následně k zajištění vody pro překlenutí sucha.

Key words

antiflood protection measures, improvement of weather forecast services, modernization of equipment of Czech Hydrometeorological Institute, flood committee

Klíčová slova

protipovodňová opatření, zkvalitnění předpovědní služby, modernizace vybavení Českého hydrometeorologického ústavu, povodňová komise

INTRODUCTION

Drought is from the point of impact to water sources and furthermore to whole water economy even more complicated than floods. The existence of many catastrophic floods in recent 17 years (Chart 1) lead and has been leading to certain improvement of preventive measure with the aim to restrict the negative impacts of flood measures.

In 1997, nearly after 100 years without any big floods, the catastrophic flood in the region of Moravia appeared. By its range and extent it has overcome historical knowledge and experience. It was certain at the same time, that not only realisation of antiflood measure, but also appropriate legislative for controlling of rescue works and management of flood were passed. Such situations appeared in nearly all european countries which have been threatened by floods since 1990's and they lead to improving flood prevention including working out the strategy which measure is necessary to realise in consideration with unpleasant situation. Buildings and exploitation of valley meadows along

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the rivers not only extremely restricted the possibilities of using these areas for harmless spill of water, but also higher technical equipment of buildings extremely increases flood damage.

All given circumstances lead immediately after 1997 to searching of historical intentions of antiflood measures along important rivers of „Povodí“ and their division into priority in document called General of antiflood measures from 1998. [1]

Practically side by side started works for preparation of new legislative which can be used in flood situations for security works and also activities and equipment of fire brigade has been improved. Very strong local floods in river basin Elbe emphasized the needs of systematic measure. The Strategy of prevention from floods for the Czech Republic were approved by the government in 2000, which was formed by the Ministry of Agriculture in cooperation with the Ministry of Environment. The whole complex of laws (Chart 2), has been accepted gradually, which represents the quality set of regulations for the management of floods, organization and ensuring of security works, where public administration have been involved(village, municipality, regional authority).The set of given laws belongs to the best „flood „ legislative in Europe and since 2001 its utilization have been realized.

The quality of weather forecast service has been extremely improved by the modernization of equipment of the Czech Hydrometeorological Institute (radars, model SW tools) and by the enlargement of cooperation with foreign partners. The equipment of control rooms of „Povodí“ has been improved, Network of water measuring and rainfall measuring stations was improved as well. They are equipped with the long- distance transfer of data. It all enables the continuous awareness of citizens, but also application of mathematical models of progress of flood waves. The possibilities of manipulation in water dams for catching flow rates and limitation of the range of flood everywhere there could be depend on it.

Table 1 – Flood consequences in certain flood situations

Flood situation [years]	Lost of people lives	Flood damages [mil. CZK]	
		totally	From this at dams
1997	60	62 600	6 600
1998	10	1 800	
2000	2	3 800	606
2001	0	1 000	100
2002	16	75 100	4 630
2006	9	6 200	2 238
2009	15	8 500	1 392
2010	8	15 200	3 400
2013	15	15 400	2 196
total	135	189 600	21 162

Source: Ministry of Agriculture of the Czech Republic, water

„Flood legislative “of the Czech Republic – legal regulations accepted as a reaction to flood situations in previous years.

- Zákon č. 238/2000 Sb., o Hasičském záchranném sboru České republiky, v platném znění
- Zákon č. 239/2000 Sb., o integrovaném záchranném systému a o změně některých zákonů, v platném znění
- Zákon č. 240/2000 Sb., krizový zákon
- Zákon č. 254/2001 Sb., o vodách a o změně některých zákonů (vodní zákon), v platném znění
- Vyhláška č. 236/2002 Sb., o způsobu a rozsahu zpracovávání návrhu a stanovování záplavových území
- Statut Ústřední povodňové komise. Usnesení vlády č. 806 ze dne 25. srpna 2004
- Metodika stanovení aktivní zóny záplavového území. Ministerstvo zemědělství a ARCADIS a. s., Praha, 2005, 18 s. [1]

1 THE SUPPORT AND COOPERATION OF ANTIFLOOD MEASURES

The foreign support from Denmark and the Netherlands was very essential for development of model instruments which can be used for design of technical antiflood measure. They enabled (in studies of outflow ranges of „Povodí“ which was supported by the Ministry of Agriculture), to verify the effects of these technical constructions. The course of flood in Prague in 2002 confirmed very important role of these measures, when mobile barrier designed according to model in fact protected the historical centre of The Old Town.

Together with progress in weather forecast service, the mass expansion and improvement of mobile phones was realized which made transfer of information quicker and more accurate. The Ministry of Agriculture ensured in years 2005 – 2007 development of „Information system of public administration“ as a shared system of central authorities (e.g. Ministry of Environment, Ministry of Defence, Ministry of the Interior, Ministry of Health and Ministry of Transport). Concerning the prevention of floods, data about flow rate form the most important part of this system as well as the level of water surface in dams. The information from measuring centres are published both ČHMÚ and „Povodí“ for all citizens and moreover they are given in six languages (it means, they are available for citizens of neighbouring countries as well). This information system (www.water.gov.cz) is highly appreciated by neighbouring countries and many of them are building similar systems.

It can be said that the main role in the management of floods and controlling security works plays the intensive communication among these institutions – „Povodí, ČHMÚ, Operating centre of Fire brigade and flood committees. The technical development enables not only transfer of information, but also video-conference are being used – in 2013 was successfully done the first one in Operating center of Fire brigade and it influenced the communication between Central flood committee and Central Emergency Committee with county representatives very positively. [2]

In short we can say that since flood in 2002 very good communication and cooperation of all involved parties have been realized. [3]

It is necessary to emphasize the role of „flood committees“, which is crucial – not only while floods, but also in period without floods, because supervision of updating of floods plans

(compulsory according to law 254/2001 Col.)and its maintaining helps to restriction of flood damages. Delimitation and subsequent assessment of flood areas (including „active zones“, where no construction is allowed) has the essential meaning for local plan of municipality. Unfortunately, there are still such cases, where local authorities give preferences to development plans of municipality to threat of flood situations and they allow building activity regardless the opinion of „Povodň“.

2 SUBSIDY PROGRAMME OF MINISTRY OF AGRICULTURE

Restriction of local extent of flood and decreasing of flood damages are ensured by technical antiflood measures – building dikes, making bigger capacity of river beds, adjustment of dam handling mechanism and first of all making retentions (polders, basins, expanding existing accumulations), which are the content of donating programme of Ministry of Agriculture and its phases are realized by the administrators of rivers. A summary of certain phases is in chart 3. For realization of measure it is necessary to have lower expenses for its construction than the value of protected property. The evaluation of actions in phase 1 of programme (2002 – 2007) shows that investment in the height of 4,1 billion CZK has brought an increased protection for 315 thousand people and for property in total value of 240 billion CZK. The similar evaluation will be done after finishing construction works in phase II as well, which was prolonged for one year due to flood in 2013. [1]

Involvement and functionality of constructions for protection from floods has brought evaluation after previous flood. Constructions realized after 2002 (together 597) we repeatedly used 279 times. During last year flood 94 constructions were offended from this 79 constructions were useful, 8 of the haven't been completed yet, but in spite of this fact they were very positive, 4 of them were crossed over by the flood and in 3 cases they fulfilled their role only partly because of technical and organizational problems.

Table 2 – Phases of programme „ Support of prevention from floods“

I.	Phase- „Beginning“ – in years 2002 - 2007	4,1 bil CZK
II.	Phase – „Development“ – in years 2007 - 2014	11 bil CZK
III.	Phase – „Retention“ – in years 20014 - 2019	started (so far 4,5 bil CZK)

Source: Ministry of Agriculture of the Czech Republic, water

3 THE PROGRAMME FOR REMOVING OF FLOOD DAMAGES

From the total value of flood damages the damage concerning water dams, river beds, rivers and water management infrastructure was 11 %. These damages are necessary to repair as soon as possible, because they could be the reason for deterioration of possible next flood.

That's why Ministry of Agriculture has a programme, where are allocated amounts from the state budget after certain floods for sanation of risen damages. The height of subsidies is between 60 – 80 % of damage given in statement of special committee.

According to estimation of investment into technical measure, which was made by „Povodí“ in 2006 is clear that for improvement of flood protection in our area is needed about 50 billion CZK. Nowadays about half of this amount was covered when we take into consideration all invested funds not only in programmes of Ministry of Agriculture but also Ministry of Environment, Regions, water managers of rivers and municipalities. It is supposed that in next 12 years (till 2027) the rest part of amount should be covered.

The phase III of programme „Support of prevention from floods“ of Ministry of Agriculture (till 2019) will be focused first of all for increasing accumulation and retention of water during floods. It is necessary to mention that realization of these measures is extremely complicated by proprietary settling up of lands from private owners necessary for realization. Even though it concerns the constructions and objects in public interest (to protection of lives of the citizens in threatened areas), there is no success in acceleration of construction, but quite often the realization isn't done and one its tool is to implement these constructions into Principles of territorial development of the region and afterwards enforced implementation into municipalities territorial plans. From this point of view such enforcement fails and it even leads to critique of decisions of regional authorities.

In agreement with „flood regulation“ of European Union (2007/60/ES) maps of flood danger and maps of flood risks for the area were done in term 31. 10. 2013 and also maps for areas with important flood risk in the area of the whole Czech Republic. They are published in Central data store, whose purchaser is Ministry of Environment at the address: <http://hydro.chmi.cz/cds>. Obtaining of flood danger maps and flood risks was co-financed from the funds of Operating programme of Ministry of Environment and State fund of Ministry of Environment. They are the basis for working out the plans for managing flood risks, which will be approved till 22. 12. 2015 by the Czech government and for their realization will be possible to use prepared Operating programme of Ministry of Environment 2014 – 2020. [1]

CONCLUSION

Shortly given facts show us how extremely the prevention of floods in the Czech Republic has been improved since the first catastrophic flood in 1997. The course of flood in 2013 it practically confirmed, when despite its range the level of damage wasn't so high and the security works were very useful, first of all thanks to readiness and equipment of fire brigades (both professional and voluntary) and also thanks to experience of State Administration. The primary role of weather forecast and wide spreading of information for controlling flood activities and security works has been confirmed. It is pleasant that many European countries take experience of the Czech Republic into consideration and it is common for our authority officers and employees of water management companies and research institutes being invited to international conferences or to consultations.

In conclusion it is suitable to emphasize the principle: The period after flood is a period before another flood – and it necessary to use it for improvement of preparations and protection because it is a natural phenomenon whose existence can't be influenced.

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