**Workshop „Drought as a creeping catastrophe – its formation**

**and possible impacts“.**

 **Third workshop from the series called „Prevention of catastrophes – protection of inhabitants and environment“ with the subtitle “Facts and myths about climate change**”, took place **in Prague on November 4, 2014**. Similarly as the previous workshops this event was organized by the Czech Association for Environmental Care together with the Czech National Committee for Disaster Reduction. More than 90 specialists from the state and public administration and crisis management, nongovernmental organizations and specialists from industry and education participated in this workshop.

The main goal of the workshop has been to explain drought from the point of view of disaster risk prevention as a rather furtive and dangerous phenomenon which can cause a very negative impact. Drought having very slow beginning and difficulties with prediction differs from the most of the common disasters but its impacts could be enormous in many parts of Europe. Similarly, droughts can hit some areas in the Czech Republic and, consequently, it is very important to prepare for droughts ahead at all state, regional and community levels. It necessary to increase preparedness and prevention for drought and the special workshop has shown to be very helpful for such a purpose.

 Lecturers concentrated on explanation of special features of drought – definitions, criteria and indicators as well as impacts of long-term droughts. It is very important to show possible connection of drought with climate change and especially to point out all possibilities of preparation for drought periods in villages and cities as well as in cultural land. Both lectures and discussion during and at the end of the workshop have shown some drawbacks in preparedness for drought in the Czech Republic. The preparedness for drought has been obviously smaller than for the floods hitting the country many times in the last two decades. It is also desirable to adjust legislation for drought as a critical situation as well as for the support of the process for improvement of preparedness of all responsible organizations and all levels of state and public administration.

***The program of the workshop covered 10 lectures in two main areas:***

**AREA 1: CLIMATE CHANGE, DROUGHT AND ITS DEFINITIONS, MONITORING, IMPACTS. MEASURES IN WATER MANAGEMENT, PLANS OF RIVER CATCHMENTS, TYPE PLANS OF CRITICAL SITUATIONS**

**J. Pretel,** *(Czech Hydrometeorological Institute):* **“Drought as one of the risks of climate change”**

**J. Roznovsky,** *(Czech Hydrometeorological Institute):* “**Symptoms and impacts of drought on the territory of the Czech Republic”**

**P. Kubala,** *(Vltava River Catchment Authority):* **“Drought and flood prevention – a public concern”**

**J. Reidinger,** (Ministry of environment): **“Drought viewed from the ministry of environment”**

**M. Gregar,** *(ENTRAS):* **“Capacity artificial infiltration (MAR – Managed Aquifer Recharge) – an alternative method for increase of water supply, infiltration of water into underground collectors and its provision”**

**AREA 2: DRAWBACKS IN PREPAREDNESS FOR DROUGHT, EXPERIENCE FROM COMMUNITIES WITH ESTABLISHMENT OF PREVENTIVE MEASURES FOR DROUGHT, DISCUSSION**

**R. Vlnas,** *(Czech Hydrometeorological Institute):* **“Legal instruments for drought handling and their applications in practice”**

**L. Netušil**, *(VAK Hradec Kralove):* **“Concrete solutions – critical situations – drought – the use of legal and technical instruments”**

**T. Bilek,** *(mayor of Vrbice village):* **“Experience with preventive measures in community in a drought period”**

**E. Dvorak,** *(Crisis management of the city of Prague):* **“Drought as a slow catastrophe, its causes and possible impacts of such a critical situation at large city”**

**I. Obrusnik,** *(Czech National Committee for Disaster Reduction):* **“Drought as a catastrophe and how to prepare for such an event”**

**CONCLUSIONS**

 **The workshop showed present situation of preparedness for drought as well as of prevention for such kind of disaster. Conclusions from discussions during the workshop were summarized into the following 13 bullets:**

1. Drought is a natural phenomenon which could have negative impacts on various areas of economy. Preparedness for drought can significantly reduce these impacts. The problem is that preparedness for drought and its impacts has been in the Czech Republic (CR) much lower than for floods. It is connected with different character of drought having slow and not well defined start as well as the end and also with a difficult predictability of drought.
2. Drought has more frequent incidence and also higher extremity at present which could be connected with climate change. Despite the occurrence of drought risk in Central Europe is much lower in comparison with southern parts of Europe it is desirable to increase preparedness and include this activity into planned adaptive measures for climate change.
3. Both floods and droughts are strongly connected with landscape and we should include water retention into our strategy. Negative impacts of droughts are especially high for water management and agriculture. However, we should take into account also negative impacts of water scarcity on industry and energetics which could result in reduction or a complete cease of production. Finding out an efficient strategy for increase of preparedness for droughts needs economical evaluation of drought and its impacts on all areas of human activity.
4. We can distinguish several basic kinds of drought -meteorological, hydrological, and agricultural, etc. Drought is generally caused by lack of precipitation but negative impacts of drought periods are often worsened by higher temperatures. Various areas of CR have very different annual rainfalls and also high variability of precipitation which makes prediction of drought rather difficult. The impacts of drought have also been influenced by water management and agriculture activities and are strongly dependent on a condition of landscape. Moreover, it can lead to diminishing of retention ability of agricultural soil. The endowment policy of the ministry of agriculture should be aimed towards responsible management of farmers on their fields together with growing crops suitable for a given locality.
5. Water management is rather important both for surface and ground water. River Catchment Authorities should ensure efficient management of rivers and reservoirs. Sometimes, these authorities should solve difficult and contradictory problems – how to prepare properly for possibility of forthcoming flood or drought – adequate measures might go against each other. As a typical example could serve contradictory requirements for management of Vltava cascade of reservoirs.
6. Special advisory group WATER – DROUGHT recently established jointly by ministries of environment and agriculture could contribute to improvement of preparedness for drought. The ministry of environment recommends, besides long-term measures against drought, also operational ones – one of them being establishment of three levels of activities for drought: vigilance, emergency and danger. The ministry will also prepare indicators for flood and special plans for handling long-term drought. Presently, with regard to decrease of ground water levels supplying about 10% of inhabitants of CR, the country is probably in the drought activity level “emergency”.
7. To diminish effects of drought it is necessary to care about ground water and interconnect different sources of water in waterworks systems to secure water from more distant sources in the case of emergency. In some cases, a capacity artificial infiltration could be used for improvement of ground water supplies.
8. Some changes of legislation are necessary (especially “Water Act No. 254/2001 Sb. and also “Water ducts and sewerage Act No. 274/2001 Sb.). Establishment of ground water administration, a definition of forecasting service for drought similarly to flood prediction service and finally, definition of drought indicators have also been needed. Moreover, it is also advisable to amend some parts of “Protection of nature and landscape Act” (No. 114/1992 Sb.).
9. Building of preparedness for drought should preferably be included in territorial plans of cities, villages and also those of industry with respect to local conditions. A lack of water should be solved within waterworks systems by mutual interconnection sources of surface and ground waters.
10. The overall preparedness for drought and its impact in communities is very important. It is necessary to combine measures taken in landscape (bosks, balks and parkways), rain reservoirs, renewal of ponds and also technical measures (sources of drinking water, water duct networks and wells, sewerage, etc.).
11. Large cities should establish very close cooperation among various subjects of the crisis management system in the case of drought (plans for disruption of drinking water supply, emergency delivery of drinking water to inhabitants with respect to the priority of the health and social facilities, monitoring of water resources and forecasting forthcoming drought period).
12. Education and training of citizens, state and public administration and also business specialists has proved to be very important for improvement of preparedness for drought. However, it is necessary to ensure coordination and management of short- and long-term measures for minimization of drought impacts at the state level. It should be carried out independently on various interests of different governmental department. Moreover, the whole process of building resilience to drought should be planned for long periods and also properly financed.
13. The participants in the “drought workshop “expressed their satisfaction with the scope and organization of the workshop as well as their interest in continuation of series of workshops dealing with various aspects of disasters and their relation to environment.

Ivan Obrusník

Chairman

Czech Committee for Disaster Reduction