Report about „The ecohydrology of karst poljes“ workshop outcomes

Karst ecosystems are more vulnerable than all other environments. This fact is especially true for karst poljes which represent the largest, fertile, and inhabited oases in karst, commonly providing the only conditions favourable for human beings as well as for development of reach but very vulnerable and mostly endemic karst flora and fauna.

Karst poljes’ ecological role is extremely important, but till now not enough recognized and investigated. Due to strong and uncontrolled anthropogenic pressure during last hundred years karst poljes belong are among the most endangered environments on Earth.

Ecohydrology is the coupling of landscape processes with hydrobiology. Due to particularities of water circulation in karst areas the coupling of surface water - groundwater processes is the most important prerequisite for understanding constraints on sustainable development. Karst ecohydrology intends to integrate not only landscape with groundwater hydrology but also with freshwater biology. A karst ecohydrological approach means integration of karst studies into a more general ecological, biological (especially speleobiological), hydrological, hydrogeological, geomorphological, and geochemical context. Works on karst ecohydrology brings the diverse perspective of ecologists, speleobiologists, karst hydrologist and hydrogeologists together.

A practical and efficient application of ecohydrological achievements for sustainable development of karst poljes is the hot spot, which should be solved in the nearest future. Problem is that two sciences (ecology and branches of geosciences dealing with water appearance in karst) operate somewhat independently with different philosophies, conceptual frameworks, terminology and experimental approaches. Interaction between two different scientific approaches and concepts did not developed well enough until now. Of crucial importance is to explain how human activities (water extraction and river damming, industrial waste and air pollution, sewage disposal, extensive agriculture and sylviculture, landscape alteration due to urbanization, etc.) change water resources and circulation in time and space of karst poljes, and threat the vulnerable and extremely valuable karst poljes flora and fauna.

Special problem represents explanation of positive as well as negative consequences of flood occurrences in different poljes. This problem should be solved by interdisciplinary cooperation which will take into account the following three levels of cooperation: 1) local (specific characteristics of individual case); 2) regional (connection of analysed polje with broader area); and 3) international (it means use of international experience as well as international importance of analysed polje).

It should be stresses that each polje needs individual approach based on its specific ecological, hydrological and social characteristics. At the same time it is necessary to use all existing knowledge which can help in the achievement of this goal.
Inevitable prerequisite is organization of detailed continuous monitoring of different hydrological, ecological, climatological, physical and chemical etc. parameters. Only on the basis of such interdisciplinary assessment, analyses and interpretation it will be possible to bring reliable and maybe definite conclusions.

Climate changes and/or variability have intensified in about last twenty five years. The extremes (floods and droughts) are intensified. This fact should be strongly taken into account.

Construction of many hydrotechnical structures and engineering works in karst poljes (dams, reservoirs, tunnels, intensive agriculture, construction of drainage and irrigation systems, urbanization, groundwater overpumping etc.) caused a lot of mainly negative changes in analysed polje and possibly in broader surrounding area. Their influence on ecosystem, water resources as well as on disturbance of existing social systems was not well investigated. It is time to start with complex investigations and analyses of their consequences.

Of special importance is to establish a good relationship with local community (local stakeholders), using objective arguments without daily political interests, promoting nature and culture of the Dinaric karst.