



Water cycle, scales and vulnerability

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Abstract

Assessing the vulnerability of global water resources to environmental change depends on the effective integration of various dimensions at the river basin level. In first place, depends on understanding and integrating some external variables, like climate change, on the water cycle, water quality and availability. Secondly, it requires reframing water needs in the context of co-related natural functions, particularly soil functions and ecosystems, considering the impacts on the ecology of aquatic and wetland ecosystems, on the filter and transport functions of soils and on water quality.

Assessment of these changes depends also on a better understanding of the consequences of global change at different scales. This means long-term oriented strategies in water management and means, and integration of different institutional levels in the decision making process. In Europe, the WFD plays a crucial role in this context, and may be associated with a socio-ecological approach, relating management practices to the socio-economical mechanisms and ecological processes. But some questions are not fully answered, like: how to deal with the variety of geographical realities, scales, cultures and technological systems? How to define long-term oriented goals, under the high probability and uncertain effects at the local level? How to integrate several and distinct but unpredictable anthropocentric factors? How to consider the proper scale for different variables and actions for the definition of the most adequate institutional framework?

This paper focus on the use of integrated approaches for water-soil resources management in the context of change due to several external inputs, in the case study of the Guadiana river basin, where an integrated vulnerability assessments is taking also

into consideration socio-economic and technological aspects of water use. Developing flexible adaptation strategies to change, in order to decrease vulnerabilities, will also be considered, mainly at local level.

Key-words: Water cycle; scales; vulnerability; water-soil integration.