



The water footprint knowledge as a framework to water conflict resolution: Guadiana river basin case study (Spain)

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As the most arid country in the European Union, water use and management in Spain is a hot topic. In this country, irrigation is the largest blue water user and most green and blue water consumption is through crop evapotranspiration. The implementation of the Water Framework Directive (WFD) requires achieving good status of ground-water and surface water in Europe by 2015. It entails developing a cost-effectiveness analysis of the various possible measures to achieve this goal. Exceptions, such as achieving environmental objectives within a longer time frame, or proposing less stringent objectives, have to be justified proving social or economic difficulties (i.e. disproportionate costs or technical infeasibility). In order to achieve WFD objectives, the present paper, analyzing the water footprint (WF) and economic value of the different economic sectors, could provide a multidisciplinary framework for preparing the reports for the European Commission.

Knowledge of virtual water, defined as the volume of water used in the production of a commodity, good or service, together with the water footprint (water volume used to produce the goods and services consumed by a person or community) can contribute to a better management and allocation of water resources.

The Upper Guadiana basin is an example of conflict created by the use of water resources in a semiarid region. In this region, private crop irrigation with intensive groundwater use by individual farmers with scarce control from water authorities, has, since the 1960s, become widespread in the area, triggering abundant social and economic benefits. The associated water table drawdowns, however, have caused relevant

negative environmental impacts upon groundwater-dependent wetlands and rivers, and significant social conflicts.

Framed within the WFD, and particularly within the European NeWater project, the present study analyses the virtual water, water footprint and economic value of the different economic sectors, crop virtual water content and value, and related political issues. Within this context, the study demonstrates that the virtual water and water footprint analysis, both from an hydrological and economic perspective, can provide a framework for informing and optimising production and trade decisions, contributing thus to conflict prevention.