



Water for rice farming and biodiversity: Exploring choices for adaptation in Doñana, southern Spain

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This paper showcases the tension between the need of higher in-stream flows in the Lower Guadalquivir River Basin, in Southern Spain, to sustain its ecosystems and the high dependence of rice farming on large amounts of water for irrigation. Climate change projections suggest that this tension is likely to be exacerbated due to a reduction in precipitation and an increase in temperature. The main actors of the Lower Guadalquivir do perceive changes in water availability and quality as well as climatic conditions and are exploring options to cope with them. Equally important for the future of the area are economic and political factors such as the evolution of rice prices in international markets and subsidies of the European Common Agricultural Policy. Stakeholders in the area believe that rice farming is likely to remain central in the socio-economic structure of the Lower Guadalquivir, but are increasingly aware that new development strategies need to be adopted to face a changing world. Discussed options combine technical measures to improve the guarantee of water provision – modernization of irrigation systems, water works to control water salinity – with 'soft' measures that should improve water use and governance – transfer of research results, higher control of land and water uses, water trading and farmers training and advice. Moreover, there is a general awareness of the compelling needs for diversification of economic activity to reduce the risks linked to monoculture and for increasing the competitiveness of economic activities. Perhaps the main barrier to adaptation is that adapting to shrinking and more variable water resources creates a dilemma between water for rice farming or water for nature – mainly the Guadalquivir estuary and the associated ecosystems. However, there are a number of adaptation measures that could help harmonize those two apparently conflicting interests. To identify and reach a consensus about possible strategies to adapt to climate change the first step is to actually agree upon the fact that climate is changing and that the future will not look like the past or present. This change of mindset is needed to avoid implementing short-term measures or maladaptation. Adaptation strategies should consider water quantity and quality issues, as they are strongly intertwined. In any case, open dialogue and information exchange among local stakeholders is crucial to widen their view on possible solutions and open up new opportunities for strengthening the local economy while preserving biodiversity.