Dynamics of water scarcity on irrigated landscapes: Mazarrón and Aguilas in Southeastern Spain

Short Title: Dynamics of water scarcity on irrigated landscapes

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Abstract

The new irrigated lands of Mazarrón and Aguilas, SE Spain, have led to the over-exploitation of local aquifers and to seawater intrusion, water salinization and to declining water tables. This paper discusses a dynamic model developed to analyse the key socio-economic and environmental factors driving the whole system. The New Irrigated Lands dynamic model includes five sectors: Irrigated Lands, Profitability, Available Space, Water Resources and Pollution. The dynamic model simulates the environmental effects regarding water consumption by reference to aquifer levels, natural outflows through springs, piezometric levels and aquifer water salinity. The exploration of scenarios show that current policies based on the increase in water resources does not eliminate the water deficit problem because the feedback loops of the system lead to a further increase in irrigated land and continuation of the water deficit. This demonstrates highly counter-intuitive behaviour. This paper constitutes a contribution to the analysis of intensive irrigated lands and water management in Spain, which is mostly lacking a systemic and dynamic approach.