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Analysis of water use and crop allocation for the Khorezm region in Uzbekistan using an integrated hydrologic-economic model

The study focuses on economical and eco-efficient water management and crop allocation in the Khorezm region in Uzbekistan. This region is characterized by very intensive irrigation basically for cotton production, a vast expansion of the agricultural area, utilization of marginal land, low water use efficiency, outdated water distribution system, and a political system with stringent crop quotas and a lack of incentives to save water. The novelty of the study is the combination of hydrologic, climatologic, agronomic, institutional and economic relationships in an integrated modelling framework. Model simulations for cotton-sector liberalization, introduction of water pricing, and modification of water supply and management were conducted and indicate that water pricing is recommendable but on a very low level. Liberalization would lead to a total restructuring of crop allocation to less water-demanding crops and to crops with high economic value.