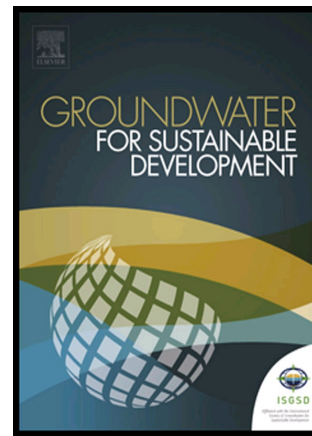


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Water and Sand: is Groundwater-based Farming in Jordan's Desert Sustainable?

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Abstract

Irrigated agriculture in Jordan's highlands relies on overexploited groundwater. Drops in water tables and water quality, but also tougher policy measures by the government, threaten the sustainability of this activity which has long thrived on lax law enforcement and cheap desert land. This paper is based on field work in two locations of Azraq groundwater basin [around the Azraq oasis and in the northern part (Mafraq)], and first presents farm typologies which show the variability of farm gross margins and the contrast between the two zones. While Mafraq stands for capital-intensive fruit-tree cultivation on legal land/wells, Azraq's agriculture is largely based on olive cultivation and wells that are either illegal or granted permits with higher block tariffs, and has a return that is only one tenth of Mafraq's. The paper reviews the constraints and changes in land, energy, water, labor and input costs and reflects on their bearing on current dynamics and future prospects. While Mafraq is found to be largely immune to policy changes and resilient to foreseeable changes in factor prices or markets, Azraq's future is threatened by various vulnerabilities, including salinization of groundwater, rising energy and labor costs that, in the long run, are likely to be overcome only by farmers emulating the Mafraq intensification model, or accepting temporary losses in the hope of a future legalization of land and wells. Solar energy now emerges as a trump card, in particular for illegal farms which, on the other hand, are challenged by recent tough water pricing regulations that are shown to make them unprofitable. The government's resolve in enforcing these regulation is put to test and will largely decide the future of Azraq's agriculture.

Keywords: groundwater overexploitation; irrigation; farming systems; desert agriculture; Azraq, Jordan

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