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“Development on the margin”

## Participation of Tree-crop Farmers in Spot Water Markets in Semi-arid Areas: an Example from Iran

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### Abstract

Water markets have been proposed as a tool for dealing with water scarcity and have been justified by emphasising their efficiency. Market-based allocation systems have the potential to ensure that the scarce water will flow to the user who earns the highest marginal value from the water. However, the number of recorded instances where water supply problems are solved by market-based systems remains limited. This study attempts to identify the decisive factors that motivate farmers' participation in spot water markets in the Rafsanjan aquifer in southeastern Iran. The precipitation level is very low in this region (90 mm annually), and the main source of water is groundwater. A two-stage random sampling was carried out in a field study from November 2008 - February 2009. In this survey, information was collected regarding groundwater quality and the annual production and cost of the pistachio gardens, as well as detailed technical and economic information about the pump or well. Additionally, the garden structure, land-water ownership, and socioeconomic characteristics of the farming household or landlord were included in the survey. A Logit model for the binary participation variable is used to test the factors affecting farmers' decisions to buy groundwater from neighbours who share the same pump. Both farmer characteristics and technical variables are considered as explanatory variables. The results show that the technical variables contribute substantially to the participation decision. E.g., a decrease in water quality, an increase in the age of the garden, and an increase in the size of the water quota reduce the probability of participation. In contrast, more scattered plots, a higher water flow level of pump, and a deeper well increase the probability of participation in spot water markets. Additionally, the application of the spatial Moran's I test on the residuals of regression shows no spatial effect inside the model. This study shows that water scarcity and improvement of water quality increase the probability of participation in water markets. Finally, the results suggest that in this area the participation in water markets is motivated more by profit increasing factors than by farmer characters.

**Keywords:** Groundwater, logit model, participation, pistachio, pumps, spot water market, water quality