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**The Thesis Submitted for the Degree of Ph.D (in the field  
of Agricultural Economics)**

# **Modelling water market in Hamoun - Jazmoriyan watershed**

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## Abstract

Continuation of the past trend in the exploitation of water resources in the watershed of Jazmourian will cause irrecoverable damage to water resources, the natural ecosystem of Halil River and Jazmourian Wetland. Therefore, there is a need to use more efficient mechanisms than the existing mechanisms for the allocation and withdrawal of water resources. The water market as an economic mechanism can play an important role in reducing the vulnerability of water supply and adaptation to climate change. Therefore, with the development of an integrated economic-hydrological model in the western Hamoon-Jazmourian watershed, the present study determines the potential benefits of the water market in different economic and environmental sectors and to determine the effect of water market formation on water efficiency. The model used consists of three main components of hydrological information, the economic sector consists of water consumption benefits in all economic sectors and a function of the environmental benefits of the basin. All components are integrated in one framework with the aim of maximizing net economic profit in all water consuming sectors of the Halil River Basin. Also, two scenarios were designed and studied to analyze the effects of water trade in conditions of water shortage and change of exchange costs. The results of the model showed that with the formation of the water market, the total annual economic benefits of water use in the whole basin will increase by 57% from 7469244 million Rials to 11753360 million Rials and the total water consumption will decrease from 2299 million cubic meters before the establishment of water trade to 2048 million cubic meters after the formation of the water market. The average water use efficiency in the agricultural sector has increased from 3038 Rials to 5763 Rials per cubic meter of water consumption and the agricultural areas will increase by 4/3%. But, the share of the wetland in the total Water withdrawal in the catchment is 17% less than the optimal state. With a 50% reduction in access to water resources, total benefits of water consumption in the whole basin, due to changes in cropping pattern, irrigation technology and water trading, increase by about 6% compared to the current situation. Also, the results of the scenario of increasing transaction costs showed that with increasing transaction costs, the volume of traded water and the profits from the water trade decrease. Therefore, it is recommended to creating the necessary conditions for establishing a water market in different parts of the country, especially in arid and low water areas, reducing transaction costs, paying attention to environmental aspects of water market formation, such as determining the water rights for this section.

**Keywords:** Water Market, West Jazmourian watershed, Hydro-economic modelling, Water allocation