

Abstract

Nowadays the methods that for determining the optimal planting crops are used often in order to increase farmer's prosperity and take steps to maximize their profits, while excessive exploitation of restricted resources make it hard or impossible to access future generations of Human to these resources. Accordingly, we used a model that in addition to supply agriculture goals, water resources as well as preserve. Due to this, in this research for determining the optimum cropping pattern and the optimal allocation of lands under conditions of water shortage in the Arzuiyeh County from an economic modeling system including of positive mathematical programming model (PMP) and approach the maximum entropy (ME) was used. The needed data and information in this research are related to the crop year 2013-2014 and type of data and documentation recorded in the governmental organizations that in agriculture and water resources parts and with direct reference to the relevant departments and agencies (Agricultural Jihad and Regional Water Company) in Kerman province and Arzuiyeh County were collected. To analyze the data and solving the proposed model from Excel and GAMS soft wares were used. The results showed that the current cropping pattern in Arzuiyeh County is not optimal and farmers of this County have willingness to pay 55% of the economic value of irrigation water. Also the results showed that with create the restrictions 5 to 40 % in supply of irrigation water; acreage of all products in Arzuiyeh County (except wheat) is reduced. In addition, the results showed that under above conditions the farmers' total marginal gross profit 1.79 to 27.9 % reduced and economic value of irrigation water 3.26 to 26.09 % increased compared to the base year is reduced. In the end, the sustainability groundwater resources of Arzuiyeh County, changing the optimal cropping pattern in direction reduce the acreage of products with water high consumption, granting facilities with low interest rates to farmers for lands equipment to modern irrigation systems, application of management strategies in conditions of water shortages, using the appropriate policy programs such as guaranteed purchase of agricultural products, determination the rate of water charge to farmers in accordance with the changes of economic value of water in the long-term and using the reduce available water resources policy combined with adjustments in water pricing policy were recommended.

Keywords: Restriction of Irrigation Water Supply, Groundwater Resources, Positive Mathematical Programming, Maximum Entropy, Arzuiyeh County



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**The Thesis Submitted for the Degree of M.Sc
In the field of Agricultural Economics**

Title:

**Determining the Optimal Cropping Pattern
with Emphasis on Water Resources Limitation
in Arzuiyeh County (Usage the Positive
Mathematical Programming Method)**

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September 2016