

Abstract

In recent decades, increasing population pressures, improved standard of living and increasing demand for use of environment have urged the government to provide better solutions for the sake of efficient manage of water resources. Since the water in the agricultural sector has no substitute and shortage of water can eliminate agriculture development, quota of water can have an important tool for water management and water rationing policy. In recent decades because of the water crisis, more countries to adopt new policies on water demand management rather than supply management trends have found water. Moreover, since the agricultural sector is the largest consumer of water, thus providing a comprehensive water resources management practices and policies necessary to correct in the field appear. In the present study, the economic analysis of the effects of irrigation quota on cropping patterns and gross profit farmers in Amol County using positive mathematical programming model was studied. The model for areas of the county that has been irrigated agriculture (Dashtesar, Marandeh, Raesabad and Oskumahalle) was built. In order to achieve practical results, the production function with constant elasticity of substitution and the quadratic cost function were included in the positive mathematical programming models. The data in this study relates to the cropping season 2012-13 and by referring to the relevant departments in the city of Amol was collected. To solve the model GAMS software version 24.1 was used. The results showed that water rationing policy will lead to reduced acreage of agricultural products in areas with irrigated agriculture of Amol, but the product of soybean in the Dashtesar, Marandeh and Raesabad and clover in the area of the Oskumahalle have most changes (most sensitive). Also, the results of applied irrigation water quota-markets increased acreage products with high profit and low water requirements, such as rice and maize crops in all regions with irrigated agriculture in the county of Amol. In addition, the results illustrated that the use of irrigation water quota policy scenarios 10 to 40 percent, leading to a reduction in total gross profit of farmers in Dashtesar (1.1 to 6.8 percent), Marandeh (3.1 to 0 / 13%), Raesabad (1.1 to 8.8%) and Oskumahalle (5.1 to 18.5%) compared to the base year terms. In the end, according to the results, whit regarding sustainability of water resources in Amol county, water rationing policy simultaneity with other policy programs like water pricing of irrigation water, the creation of local and regional markets for sale of agricultural products, buys products with price guarantee, providing banking facilities to equip farms to modern irrigation methods, etc. were offered.

Keywords: water rationing, positive mathematical programming, cropping pattern, gross profit of farmers, Amol



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