

Increasing Economic Productivity of Water by Changing the Cropping Pattern in Mazreano Village in Ardakan-Yazd

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Abstract

In this study, we investigated the source of agricultural water supply (qanat) and performance of agricultural crops in Mazreano village of Ardakan-Yazd. First, by using meteorological data and CROPWAT software, water requirement of horticultural products (pistachio and pomegranate) and field crops (wheat, barley, alfalfa and saffron) were determined in all months of the year. Then, volume of water in access of plants requirement and water deficiency in each month was calculated. Considering the water requirement of each crop relative to its economic benefit, we removed wheat, barley, and alfalfa in one scenario and assigned the water requirements of these plants to saffron cultivation. Then, the new cultivation area and the corresponding water demand were determined in each month. Considering the non-conformity of water demand and water availability in all months of the year, we proposed construction of water storage pool and calculated the net profit from the new plantings and compared it with the existing cultivation. The results showed that in this region change in cropping pattern is a proper solution for increased productivity and improving water consumption pattern. Changing the cropping pattern according to the proposed scenario could lead to three-fold economic net profit compared to the existing cropping pattern.

Keywords: Saffron, Water consumption patterns, Water storage pool, Qanat, Irrigation management

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