abstract

The crucial need of optimal utilization and management of the existing resources has loomed large in the recent years mainly due to population growth, limited and disproportionate distribution of water resources and excessive usage of them. Given that water is a more restrictive factor in most regions of Iran than land-soil, in order to optimize agricultural profit, a model is needed to proportionately allot the existing water resources to various activities rather than a model that increases farming crops. The present research has attempted to offer a model that distributes equal irrigation water among various agricultural crops in Mamassani area in Fars province, in a manner that the profit increases with consumption of each unit of irrigating water. To this end, fuzzy-goal programming method was employed. Three fuzzy goals including optimization of profit, minimization of water usage, fertilizers and toxins were juxtaposed in the form of three different scenarios. Data were collected via questionnaires, face-to-face interviews, and also surveys of Mamassani town agricultural organization. Three optimal water usage models with various importance were estimated in the goal limit. Wheat, barley, corn, watermelon and tomato were studied in this research. Findings suggest that there is a significant difference among these models. Wheat and corn are present in all of the optimal water usage models. In this way, various acceptable plans for reducing water usage can be provided to farmers, which eventually might have an enormous effect on sustainability of underground water resources.

Keywords: , Fuzzy-goal programming, Nurabad mamassani, Optimization, Water allocation

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Optimum allocation of underground water between crops in NurAbad Mamasani region

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