
M. Jenab and B. Nazari 1 *
MSc in Irrigation and Drainage Engineering, Water Engineering Department, Faculty of Technical and Engineering, Imam Khomeini International University, Qazvin, Iran.
mahn.je@gmail.com

Assistant Professor of Water Engineering Department, Faculty of Technical and Engineering, Imam Khomeini International University, Qazvin, Iran.
binazari@ut.ac.ir

Abstract

Improvement of water productivity is very essential for achieving water and food security. One of the basic strategies in this field is determination of crop yield gap and water productivity gap, which is the difference between the present actual situation and the potential situation. This research was carried out for wheat in Qazvin province according to GYGA protocols, which is an international methodology. At first, the map of climatic zones of the province was prepared based on Emberger method by using GIS. Then potential yield gap of wheat was estimated according to calibration and simulation of version 5 of Aqua crop model. Results showed that yield gap in various climate zones of the province was between 4502-6271 kg/ha, evapotranspiration water productivity gap was between 0.56-0.66 kg/m3 and water (irrigation and effective rain) productivity gap was between 0.57-0.71 kg/m3. Results showed that actual wheat yield in Qazvin province is 37 percent of the potential yield. Also, relative evapotranspiration water productivity index was 0.47 and relative water productivity index was 0.31. These indices show the ratio of the actual to potential productivities. Based on this research results, the extent of gap between optimum and current condition of yield and water productivity is very wide. Yield gap is 63% of potential yield and water productivity gap is 69% of potential water productivity. This issue represents the considerable weakness existing in management of agricultural production and irrigation and reflects the potential opportunities for strengthening these operation, improving water productivity, decreasing the pressure on water resources, and increasing food security.

Keywords: Aqua crop, Water Productivity, Irrigation Management, Evapotranspiration.

1- Corresponding author: Assistant Professor of Water Engineering Department, Faculty of Technical & Engineering, Imam Khomeini International University, Qazvin, Iran.

* - Received: July 2017 and Accepted: March 2018