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Evaluation the Agricultural Crops Water Footprint in the Urmia Lake Basin (Iran) Using Agro-wf Software

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Abstract

Iran as a country that is located in dry area, large parts of this country are characterised as arid and semi-arid environment. Water consumption per capita in Iran was about 4000–5000 Cubic metre per year in 1959–1960. Nowadays this index is less than 2000 cubic metre and it has estimated that it get down to less than 1000 cubic metre in 2021. Also It has estimated that population of Iran will be increasing up to 100 million people in 2030 and we will need about 150 billion cubic metre of water per year to supply food security based on 2600 K Calories energy per capita.Basic consumptive water and water footprint for any crop are changeable and in this process, the parameters such as climate, crop productions, people consumption pattern, agriculture practices and water application efficiency have important roles. Therefore, it is necessary to have a concept that by using them, actual crop water requirement is calculated. Water footprint index has been presented as a global index to evaluate actual crop water requirement for any regions. For this purpose, five major crops include; wheat, sugar beet, tomato, alfalfa and corn that accounted of 77 % of basin production have been selected and evaluated on seven areas in the Urmia Lake basin. In order to calculate evapotranspiration, water requirement and Water Footprint, the GRO-WF software was used and then obtained results were investigated in three parts included blue, green and grey water footprint. The results showed that wheat with 2064.99 m^3/ton and tomato with 362.61 m^3/ton, have highest and lowest water footprint respectively. Also sugar beet and maize, have highest grey water footprint so these products are leave more pollution in the environment. The results of zoning showed that blue water consumption was high in Tabriz and Maragheh plains whereas for Urmia and Tekab plains green water consumption was considerable. Finally, in order to increase different crop water productivity, it is necessary to calculate all crop water footprints and selecting proper farming system (conservation agriculture) on the base of water footprint that can reduce agricultural water consumption.

Keywords: AGRO-WF, blue water, green water, water footprint

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