



University of Zabol

Graduate school

Faculty of Agriculture

Department of Agronomy

**The Thesis Submitted for the Degree of M.Sc in the field of  
Agronomy Science**

**Estimation and evaluation of blue and green  
water footprints of wheat and garlic products in  
Sistan province of Iran**

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## **Abstract**

The water footprint index as a global indicator shows the actual amount of water consumed based on the conditions and climate of each region. Identifying and evaluating the amount of water required for different agricultural products is of great importance and such evaluation can be very effective in identifying and providing appropriate solutions to reduce agricultural water consumption. The goal of this study is to calculate the water footprint (separately for water and green components) of wheat and garlic products in a two-year period. To study the water footprint in wheat and garlic, different parts of Zabol city were introduced as selected stations. CROPWAT software was used to calculate the potential evapotranspiration. The information required to calculate evapotranspiration, including maximum temperature, etc., was provided by the Meteorological Organization of Sistan and Baluchestan Province. The amount of plant coefficient was calculated for each stage of plant growth, which in case of difference, multiplied by evaporation and transpiration, the water requirement of the plant at each stage of plant growth was obtained. Then, by adding the amount of infiltration and leakage, the amount of blue water was calculated, the highest and lowest of which were estimated in the relevant stations. The highest rate of evapotranspiration was related to the middle stage of wheat plant growth. The trend of green and blue water in wheat and garlic plants decreases during the growing season and this decrease is more in blue water. In wheat, the share of green water was higher than blue water. The reason for this could be the water stored in the soil profile that has remained from previous years. The reason for the increase in the footprint of blue water in garlic can be attributed to the fact that part of its growth period is in the summer quarter, which evaporates and transpiration has an upward trend.

**Keyword:** Blue water, Green water, Water footprint, Water requirement.