

## **Abstract**

**Access to water and food security in arid and limited water resources regions requires optimal cropping pattern. In this research, virtual water (VW) trade was implemented to find the best cropping pattern in Sistan and Blouchestan province of Iran. 44 common cultivated productions in the province were classified in 6 classes including cereals, legumes, vegetables, oil crops, fruits, and potato. Required data were collected during 2000-2011. Crop water demand, total VW (TVW) of a crop consists of green and blue VW, and VW balance were calculated. Much of the province food security was satisfied through crop productivity increase rather than cropping area so that, during the study period, total crop sown area and crop production of the province were increased 43% and 118%, respectively. The improper distribution of crops in the current cropping pattern led to a high mean value of TVW both at the county (0.53-4.35 m<sup>3</sup> kg<sup>-1</sup>) and province levels, where blue VW accounted for 91.3-98.5% of TVW. By considering three indices including VW, unit blue water value, and the ratio of required blue water to the total water allocation for the agriculture, the optimal cropping pattern was proposed as potato followed by vegetables, legumes, fruits and cereals. Based on the results, production of vegetables and potato both at the county and province levels might be a target for improvements and might contribute significantly to reducing national water use for irrigation.**

**Keywords: Blue VW, Water productivity, Food security, Spatial cultivation prioritization**



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