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Identifying Economically Efficient and Ecologically Sustainable Sectors for Structural Transformation in the Khorezm Region, Uzbekistan: Input-output Analysis Approach

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Abstract

The worldwide increases in water demand due to population growth, industrial and urban development bring a need to increase the efficiency of water use, and increase the economic value of this scarce resource. In particular, as a result of ill water management and lack of good governance in the Aral Sea Basin, downstream areas such as the Khorezm region, where agriculture contributes 50 % of regional GDP and 70 % of population are rural, are suffering from frequent water stress during the irrigation period. In the aftermath of independence, in spite of liberalisation reforms in the agricultural sector, cotton production with its huge water requirement and low economic efficiency slightly decreased. Considering the need to identify key sectors that constitute the basis for the growth and development of the region, the main objective of this paper is to analyse economic and water use inter-linkages between economic sectors. To meet this goal, input-output model of the region are developed and virtual water flows between the sectors are estimated. The results show that Khorezm region is net exporter of virtual water since cotton fiber export provides 98 % of total hard currency revenues despite annually increased water stress. Moreover, aggregate direct and indirect water productivity analysis for each sector on the basis of input-output models indicates that the production of low-cash and high water consumptive crops are dominant in the economy of the region. While officially promoted crops such as cotton and wheat obtained high priority due to hard currency generation and food self-sufficiency policy, they are found to be less attractive in both economic and ecological terms. On the contrary, both water productivity and economic efficiency of fruit and vegetable production and processing industries are high. However, a suitable market infrastructure and an improved institutional framework are important prerequisites for successful utilisation of the comparative advantages of the region in these crops.

Keywords: Agriculture, input-output analysis, key sectors, Khorezm region, virtual water