

## Environmental and Socioeconomic Indicators of Virtual Water Trade: A Review

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### Abstract

The concept of virtual water has been largely applied in the study of regional, national, and global water flows with particular emphasis on water scarcity. Despite water traditionally being managed locally, certain global forces influence the local water resource scarcity/availability and hence virtual water exchanges worldwide. It is therefore of necessity that the significant forces be examined to understand the relationship between available water in a region and the variability and trends in environmental, social, and economic factors that are of utmost importance in the formulation of water resources management policies. This study therefore reviewed recent literature from 2003 - 2019 to determine the significant indicators of virtual water trade at different spatiotemporal levels. The study examined and compared the major approaches to virtual water trade flows accounting, and also identified and discussed policy implications and future research options concerning the analysis of virtual water trade. Available information has shown that virtual water trade is significantly influenced by economic (GDP, Demand-Supply of goods and services), geographical (Distance), institutional (population) and environmental (water availability, arable land, precipitation) factors. Reports further show that the selection of a given approach for virtual water trade flows accounting will depend on the scope of the study, the available datasets, and other research preferences. Accordingly, this study suggests that the adoption of multidisciplinary approaches to virtual water trade, taking into consideration the spatial and temporal variations in water resources availability and the complexity of environmental and socioeconomic factors will be pivotal for establishing the basis for the conservation of water resources worldwide.

**Keywords :** water scarcity; virtual water trade; environmental and socioeconomic indicators; policy implications

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