



Optimized Water Resources Planning Based on Virtual Water Consideration

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ABSTRACT

Virtual water is the water 'embodied' in a product, not in real sense. It refers to the water needed for the production of the product. Most of the countries located in dry lands replace the water needed for domestic production with more necessary applications by using the policy of importing food from wet land countries. Less emphasis on agricultural self-sufficiency and preferring the importing of water consuming products can keep the inner water resources in safe level. In addition, the remaining water can be used in producing less water consuming products and the relevant exports. Lots of the water industry problems can be solved by revising water resource management strategies using the virtual water concept and adequate potentials in this section. In this paper, three different scenarios due to international trade of food products have been investigated, and finally the most appropriate one is chosen.

INTRODUCTION

The water consumed in the production process of an agricultural or industrial product has been called the 'virtual water' contained in the product. If one country exports a water-intensive product to another country, it exports water in virtual form. In this way some countries support other countries in their water needs (Both agricultural and industrial). For water-scarce countries like Iran it could be attractive to achieve water security by importing water-intensive products instead of producing all water-demanding products domestically. The real case is Iranian import of rice from Thailand. Reversibly, water-rich countries could profit from their abundance of water resources by producing water-intensive products for export. Trade of real water between water-rich and water-poor regions is generally impossible due to the large distances and associated costs, but trade in water-intensive products (virtual water trade) is realistic. Virtual water trade between nations and even continents could thus ideally be used as an instrument to improve global water use efficiency, to achieve water security and the consequent food security in water-poor regions of the world and to alleviate the constraints on environment by using best suited production sites. Finally, we have proposed three different scenarios in order to evaluate the effects of virtual water trade:

- 1- Complete self-dependency on agricultural products.
- 2- Relative self-dependency and importing virtual water
- 3- Relative self-dependency; importing and exporting virtual water.