

# Nile Basin Initiative: Challenges and Effectiveness in Sustainable Agricultural Development (A SWOT Analysis Approach)

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## **Abstract**

Abstract: Nile River is the main source of water for the Nile basin countries. The provided water does not satisfy the enormous demand of water in the region. It is expected that at least six out of the ten countries that share the Nile water will face water stress in the early 21st century. Nile water for the downstream countries like Egypt and Sudan is considered to be of a vital national priority.

Sustainable agriculture as a way of raising food that is healthy for consumers and animals, that does not harm the environment, is humane for workers, respects animals, provides a fair wage to the farmer, and supports and enhances rural communities has become of a vital need to the Nile basin countries.

Moreover, the stochastic nature of water supply and dynamic nature of water demand imply an allocation model with certain characteristics to maintain the sustainable development of the basin countries in order to maximize the overall welfare. Thus, the need for Pareto-optimal model is a prerequisite as the unidirectional of the river, is often considered as a source of tension and conflict between countries that is difficult to solve. Our goal in this paper is to arrive at the Pareto-optimal allocation model that maximizes the welfare of Egypt and Ethiopia without causing any significant harm to any of them. The Model that will be developed in this paper following the same methodology of D. Marc Kilgour and Ariel Dinar which is based on the idea of utilizing the water of the river by transferring it between countries within the river basin. To state differently, it allows the downstream countries that are in need for water to get it from an upstream country by compensating that country for less water available for usage, trying to balance the growing demand of water in the Nile region for the sustainable agricultural development , which would lead to food security raising the economic welfare for the basin countries.

*Journal of Modern Egypt 2012, January*