

Allocating Water Resources for Agricultural and Economic Development in the Volta River Basin

Patrick Obeng-Asiedu

The decreasing availability of freshwater in the Volta basin has been a major issue between Burkina Faso and Ghana, who occupy more than 80 percent of the basin. Both countries are expected to face water stress in the near future, and the absence of appropriate framework for coordination and cooperation between them could lead to conflicting relations, fostering mutual suspicion and inaccurate reports of their activities. However, it is likely that significant amounts of water will be reallocated from agriculture to higher valued domestic and industrial demands and this trend could fuel competition among the water-using sectors in the basin. Population pressure and changes in the hydrological cycle could also influence the future competition for water in the Volta basin. Although the Volta River has a great development potential, lack of investment in infrastructure development has plagued the basin. The impacts of these developments on water users in the basin have not been studied.

Hypotheses

- a) The complex dynamics, tradeoffs and intersectoral water resource competition observed among various water uses is best explained in an integrated river basin framework.
- b) River basin modeling, coupled with an appropriate institutional base can provide an effective mechanism for overcoming institutional, social, and cognitive limitations in dealing with complex water resource management problems.

Objectives

The main aim of this study is to evaluate the costs and benefits as well as the tradeoffs and complementarities across water using sectors in the Volta River Basin, specifically Burkina Faso and Ghana.

Expected Output

Water Allocation Model

The output of this work is the evaluation of alternative mechanisms (scenario analysis) for inter-sectoral water allocation through the development of an empirical model, which integrates the hydrological-institutional characteristics of water allocation in the Volta river basin; and analyzes the economic costs and benefits of water use in the various sectors. The optimization model is coded in GAMS.