

Effect of water related issues to crop production at Mekong river basin .

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Water is essential not only for human being but also other creatures and environment. It is necessary for us to manage it properly and effectively. About 60-70% of global pure water has been used for agriculture and most of it has been used for rice production mainly in Asian countries. About 90% of the world rice production is grown in the humid regions of Asia (South- and South-East) characterized by a monsoon climate. Rice accounts for 50% of global cereal production, providing staple to about 40% of the world population, mainly in developing countries.

In view of its importance on global water use and as staple food for many millions Asian people, water must be managed properly. It is necessary to make clear impact of water related issues such as water management, water allocation priority etc. to crop, mainly rice, production especially in rice dominant region such as Mekong river watershed. Because rice accounts for a large share of global fresh water use in agriculture. In this report, these issues are dealt with, and mainly water management are dealt. In addition, impact analysis was carried out with simulation model which has developed by mainly IWMI (International Water Management Institute) in 2004.

There are many hydrological models available. But the strong linkages between economic trends, agricultural policies and water use call for an integrated and multidisciplinary modeling approach. The WATER-SIM model, developed by the International Water Management Institute (IWMI) with in put from the International Food Policy Research Institute (IFPRI) is a suitable tool to explore the impacts of water and food related policies on global and regional water demand and supply, food production and the environment. Integrating economic aspects with climate, agronomy and hydrology, the model is used to assess the impact of water and food related policies on water scarcity, food production, food security and environment, at the global, regional and river basin scale. Through a flexible modeling framework, WATER-SIM can be used to explore a variety of scenarios and trade-offs. While designed as a global model, the spatial resolution of the model allows looking at the Lower-Mekong basin to explore water issues such as water allocation scenario, efficiency, etc. The results enable preliminary insights of the impact of water issues to crop production in Mekong river basin.

Broadly speaking, the model consists of two integrated modules: the food demand and supply module, which is adapted from IFPRI's IMPACT model; and the water supply and demand module which uses a water balance based on the Water Accounting framework developed by Molden D.(IWMI) and underlying PODIUM model combined with elements from the IMPACT-WATER model.

Some preliminary results what water issues do impact to crop production in lower Mekong river watershed are studied using the WATERSIM model. The main results which had obtained here are as follows;

- 1)Water allocation priority has a limited impact on crop production.
- 2)Improving Effective Efficiency will reduce crop water depletion and hence diversions to agriculture, but the gain of improved efficiency is relatively limited.
- 3)By enhancing water productivity during the dry season increased, rice production could increase between 27% (Laos-Cambodia) and 48% (Thailand), getting an additional 3.6 million tons of rice using the same amount of water.
- 4)There is scope to free up water by improving water use efficiency at field level but this analysis indicates that improvement in water productivity (i.e. getting more output per unit of water consumed) has more scope than improvements in field efficiency or changes in water allocation policies.

The further studies are necessary to ascertain.