



## **Hydrological potential, economic evaluation, and institutional constraints: Decision support for irrigation development in the Volta Basin**

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Irrigation in the Volta Basin is very limited even though unreliable rainfall hampers the productivity of traditional rainfed agriculture. Within the 167,000 km<sup>2</sup> that form the Ghanaian part of the basin, a mere 8000 ha has entered official statistics as irrigated agriculture. In Burkina Faso, 20,000 ha are irrigated, which is only a small fraction of total irrigable land. In order to provide national governments with information concerning possible investments in the irrigation sector, the GLOWA Volta Project ([www.glowa-volta.de](http://www.glowa-volta.de)) examines hydrological, economic, and institutional potentials and constraints of irrigation development.

Hydrologically, only a fraction of the available water resources has been developed to support food production. Presently, different types of irrigation can be found. There is a handful of larger irrigation schemes, which were developed during the last wave of investments in the seventies. In general, these large schemes were extremely expensive (US\$45,000/ha) and failed to supply projected command areas with reliable supplies. Small, reservoir-based irrigation schemes at village level are a popular form of irrigation development, especially in Burkina Faso. Recently, dry-season horticulture, using shallow wells, is taking off.

Financial analysis shows that returns on water in the irrigation sector are higher than for hydropower generation. This is mainly due to the fact that in the Volta Basin, hydropower generation takes place downstream, close to the sea, where reuse of water that went through the turbines is very limited. From large to small scale irrigation, investment costs decrease and resource-use efficiencies increase. Given the fact that

the financial analysis for irrigation development is positive and that water availability is not a constraint, institutional factors may be the better explanation for the limited acreage of irrigated agriculture.

In-depth analysis shows that key-factors underlying the lag in development of irrigation in the Volta Basin are institutional. Such factors include some obvious constraints such as lacking capital and credit systems. Equally important, however, seems that irrigated agriculture is governed by unwritten rules that provide different social groups with different levels of access. People with good government ties can be found in the large scale systems, while marginalized groups are often only able to irrigate from hand-dug shallow wells. Organizational difficulties increase with scale and are the main reason behind the disappointing returns on investments in large scale irrigation. If investing in the irrigation sector is to alleviate rural poverty, the specific organizational form and scale of the new irrigation schemes are apparently very important.

During the Johannesburg summit on sustainable development, water was put squarely on the international political agenda. African states have followed up by initiating the African Ministerial Conference On Water (AMCOW). The European Union has started its Water Initiative. These larger political developments seem to indicate that investments in the African irrigation sector will rise soon. The present study shows that a straightforward and careful analysis could help to prevent a repetition of the failures of the seventies, and ensure that such investments would indeed support the stated goals.