

# IRRIGATION IN WEST AFRICA CONSTRAINTS AND PROSPECTS FOR ITS DEVELOPMENT

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*The analysis of irrigation projects in Africa over the past several decades, leads us to conclude that irrigation, in spite of large-scale investment, has been only marginally effective. It does not as yet provide a solution to the vagaries of climate any more than it boosts food production in a truly meaningful way.*

In Club du Sahel and World Bank assessment reports on hydro-agricultural projects, frequently and in spite of considerable initial investment and maintenance costs, irrigation fails to provide either high yields or multiple crops, and is affected by a whole range of problems - technical, management, training, agricultural policy, and financing.

Yet, in many intertropical countries, an increase in food can only be achieved by an increase in the number of irrigation projects and the rehabilitation of those abandoned. It is imperative, therefore, to define and propose a strategy for hydro-agricultural improvement which encompasses not only technical and economic aspects, but also the participation and training of the farmers involved.

## THE OBJECTIVES OF IRRIGATION

In the intertropical regions there is an overall imbalance in water resources in relation to the needs of the inhabitants, their herds and their crops. Such an imbalance in the supply of and the demand for water, highlights the essential contribution of hydraulics to agricultural development, both in the installation of counter-

risk irrigation during the rainy season, and of intensive irrigation during the dry season.

Irrigation effectively enables the safeguarding of crops from the adverse effects of drought and hence provides sounder conditions for: crop diversification; increased volume of production through higher yields and extended land surfaces; better rural employment prospects through intensive farming; development of natural resources in terms of land and water and to respond to demographic pressure; and settlement of farming communities.

An increase in the number of new irrigation systems, the upkeep and improvement of existing systems, and the rehabilitation of abandoned ones, remains an absolute priority if

an increase in the food production of almost all developing countries of intertropical regions is to be achieved.

## CHARACTERISTICS

Irrigation development in the West African Sub-region started, practically speaking, in the post-colonial period after 1960. This means, in contrast to Asia, that there is an absence of irrigation tradition and of irrigation bureaucracies as such. Instead, irrigation development is in general entrusted to para-statal organizations who, in addition to irrigation, assure many other functions related to agricultural production, upstream as well as downstream. These functions demand a great amount of attention from the organization.

## ESTIMATED IRRIGATED AREA IN RELATION TO IRRIGATION POTENTIAL

(SOURCES : FAO 1986)

Area in ,000 ha

COUNTRY	IRRIGATION POTENTIAL	AREA DEVELOPED		DEVELOPED AS % OF POTENTIAL
		MODERN	TRADITIONAL	
BURKINA FASO	350	10	6	5
CAMEROON	340	17	4	8
CHAD	1,200	10	40	4
MALI	340	130	60	56
NIGER	270	10	15	10
NIGERIA	2,000	100	800	45
SENEGAL	350	40	70*	31
TOGO	90	5	~2	8
<b>TOTAL</b>	<b>4,940</b>	<b>322</b>	<b>997</b>	<b>27</b>

\* Estimated.

Hydrologically speaking, irrigation perimeters in West Africa are small. There is only one large centrally managed system of about 40,000 ha (Office du Niger in Mali). A second category consists of systems with perimeters of 50-2500 ha (most common 300-500 ha) whose management is generally shared between some type of farmer organization and the earlier mentioned multi-functional para-statal organization. In Niger management is generally in the hands of farmers' cooperatives who receive technical assistance from the Government. A third category consists of small, farmer-managed, village irrigation systems of less than 50 ha. Finally, there is what is called the agricultural use of water resources with limited potential, or irrigation around low-yielding tubewells and small earthen dams. Here the size of the "perimeter" is generally less than 5 ha.

Another important characteristic of irrigation development in West Africa is that it is generally based on pump-lift irrigation (except in the inner-delta of the Niger in Mali and some irrigation schemes in Burkina Faso). This makes irrigation in West Africa a costly affair. Because investment costs are extremely high, irrigation development and subsequent operation and maintenance is a matter of constant financial and economic concern.

### THE MAIN DIFFICULTIES

To assess a development project, many subtle factors have to be taken into consideration. Success or failure cannot be measured only in terms of "all or

nothing". Similarly, the reasons for partial failure are not always purely technical, economic or sociological but rather a complex combination of all three, difficult to analyse with absolute precision.

However, for purposes of simplicity and clarity, we feel compelled to list some of the main difficulties encountered in the technical and institutional management of irrigation.

-The prohibitive system costs. The realization of one hectare costs 5.000 US \$ in Morocco that is to say nearly 1,500,000 FCFA. In Senegal this cost is two fold and in Mauritania it is three fold. In Niger system costs amount to 7,000,000 FCFA. The maintenance and use of water pumping and distribution equipment is also very expensive and can reach 70.000 FCFA and represent up to 50 % of the global operating costs.

-The lack of farmer training: Farmer illiteracy makes access to management techniques difficult for them. This situation does not allow the farmers to actually own their schemes.

-The policies for setting agricultural product prices does not provide farmers with sufficient income.

-The lack of a clear land tenure system: The common laws on land tenure and the States' jurisdiction are not always in harmony. A degree of insecurity on user fees does not motivate the farmers to invest.

- The resistance, and even the refusal of administrations to delegate their powers to the farmers: This attitude is partially explained by contradictions that exist between the States' objectives and the farmers'. The State demands an immediate maximum production level that must serve as a substitute for imported products. The farmers are preoccupied by family food self sufficiency, income supplements and access to property. They consider irrigation as a complementary activity that sometimes competes with rainfed agriculture.

This short analysis demonstrates the difficulties of shifting from a rainfed agriculture to intensive irrigated agriculture. In fact, farmer communities have empirically developed farming systems that are reliable within their ecological environment. To attempt to substitute them with other technical approaches is always a gamble because these farming systems are practiced in a tradition that is a result of a compromise between all ecological, technical, and socio-economical constraints that farmers suffer from. The shifting rhythm from traditional agriculture to irrigated agriculture is slow and progressive, linked to the mastering of techniques introduced by the projects. Irrigation is not simply a production factor, complementary to the previous farming system, but irrigation demands a complete change from the farmer, abruptly thrusting him into a high productivity system.

As in many other parts of the world there is a very clear and definite policy towards government disengagement, not only in the irrigation sector, but also, and even more pronounced, in areas of input supply to the agricultural sector (services, credit, fertilizers) and the marketing of agricultural products - functions that were largely assumed by the earlier mentioned para-statal rural development organizations. The role of these organizations in this changing policy environment would be (or is already) one of technical support to farmer organizations/cooperatives that have taken over (at least part) of the tasks formerly entrusted to these organizations.

### TRENDS AND PROSPECTS

This is true particularly for the irrigation and services/extension sector which is more difficult to privatize than for instance marketing and input supply. But before the farmers agree upon the principle to take charge of the management of their irrigation scheme, they need to be convinced of the advantages of this, in this, because closely associated with the policy of disengagement is the policy of actual-cost invoicing. If joint management of irrigation systems is present, the organization rendering services to the farming community (for instance running the pumping station or maintaining the main canal) would be expected to find ways and means to charge the farmers for the actual costs of those services.

With all due respect for the states' present difficulties in facing debt and financial deficit problems, this transfer

of responsibility is often perceived as an abandoning of the farmers who are conscious of the fact that they have over several years largely contributed (without any significant counterpart support) to national production. Suspicion about the real intention of the state to transfer "all or part" of its responsibilities is also due to the fact that farmer management is inconsistent with the schemes operation regime. Its application upsets the production results of irrigation operations. It is precisely for this reason that the farmer's own management of schemes remains the only real alternative which at the field level increases the problem of relations between the individual and the State. One must also be convinced that the disengagement of the state through rural development communities must be followed up with the reinforcement of their management capability in the tasks they will have to perform within the framework of a new power balance with the producers. The necessity to maintain an equilibrium between the States' objectives and the farmers' desires means that leaders must ask themselves questions about the entire agricultural development policy of the schemes:

-What should be the optimal size of the schemes considering family labor, the desired income level, the range of farming system options ?

-Which farming system to adopt in order to ensure the sustainability of the schemes ?

-Which socio-economical environment to establish upstream as well as downstream of production?

-Which low-cost irrigation techniques must be researched in order to attain less ambitious but more realistic objectives ?

-Which farmers' organizations to promote in order to carry out the development of the schemes ?

-How to help the national communities implement this new agricultural policy?

These questions justify the research and action efforts undertaken on these issues. IIMI intends to contribute, through the implementation of a coordinated Research-Development, training and information program, to improve the performance of irrigation systems. This program will support the efforts of the different organizations, involved in managing irrigation systems : rural development communities and/or farmers' organizations.

In the West African Sahelian zone, irrigation will play an increasingly important role for national political reasons (such as food self-sufficiency), for agro-climatological reasons (the need to reduce vulnerability of agricultural production to the volatility of the Sahelian climate) or for socio-economic reasons (such as risk avoidance at the level of the individual household). The challenge is to create irrigation development models that are technically sound, socially acceptable, economically viable, and

physically consistent with the natural environment. Experience thus far has shown that there are still many unknown factors that must be taken into consideration before answers to these questions can be found: unknowns that often lead back to the fundamental question of how to integrate modern irrigated agriculture with the more traditional rainfed agriculture and livestock production systems.