

# IRRIGATION SECTOR REFORMS IN NIGERIA

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Nigeria is a densely populated country in West Africa, with a population of 89 million according to the official census although many people estimate it to be much more. It is also one of the largest countries in West Africa and dominates the region in irrigated agriculture.

The climatic conditions in Nigeria range from Sudan-Savannah in the north to tropical in the south. The rainfall also varies from north to south. The Kano State of northern Nigeria has recorded a declining rainfall trend over a period of time with an average annual rainfall of 700mm.

The total irrigated area in the Humid Tropics Zone of 11 countries<sup>1</sup> of West Africa is very low compared with the irrigable land. A large portion of arable land depends on rain-fed agriculture. In the Humid Tropics Zone, about 3 percent of the arable land is under irrigation systems while 29 percent of the potential irrigable area has irrigation facilities. Approximately 80 percent of this area is under traditional irrigation systems while the rest is under modern irrigation systems. It was estimated in 1991 (based on World Bank Report 1979, FAO Reports and information obtained from the Federal Ministry of Water Resources, 1991) that Nigeria has about 1 million ha under irrigation which accounts for about 90 percent of the total irrigated area coming



Nigerian farmer transporting small pump and pipe on bicycle. Small diesel pumps are widely used for irrigating wheat crops.

under the Humid Tropics Zone. About 90 percent of the area under irrigation in Nigeria has traditional irrigation systems while only 10 percent has modern irrigation systems defined as those with large dams or diversion weirs and headworks with water control structures. They have an elaborate network of infrastructure to deliver water and are managed independently by the irrigation agency or jointly by the irrigation agency and beneficiary farmers.

The World Bank has projected that rain-fed agriculture will not be ade-

quate to feed the people of Nigeria after the year 2000. According to FAO estimates, even after an imposition of a ban on food imports, Nigeria imported 800,000 MT in 1989. Imports have declined to 540,000 MT in 1991 according to the same source. There is however, a need for irrigation sub sector development in Nigeria to meet short-term and long-term food requirements of the country.

## Large-and Small-Scale Irrigation Systems

Nigeria has both small-scale traditional irrigation systems as well as large-scale public sector irrigation systems. The history of the traditional irrigation system dates back to the 9th century although public sector irrigation development commenced only about two decades ago. The economic implications of the nation's dependence on food imports led to the adoption of new policies by the Government of Nigeria, aimed at attaining self-sufficiency in food. Consequently, substantial investment in

### FEATURES OF IRRIGATED AGRICULTURE IN NIGERIA

Total land area	98.3 million ha.	—
Cultivable area	73 million ha.	74%
Crop coverage	25 million ha.	34% of cultivable area
Cereal crop coverage	13 million ha.	52% of crop area
Rice coverage	01 million ha.	08% cereal cover
Irrigated area	01 million ha.	08% cereal cover
Area under traditional irrigation	900,000 ha.	90% irrigated area
Area under modern Irrigation	100,000 ha.	10% irrigated area

Source : IIMI Nigeria 1992.

<sup>1</sup> The 11 countries of the Humid Tropics Zone are Benin, Cameroon, Congo, Cote d'Ivoire, Gabon, Ghana, Guinea Bissau, Liberia, Nigeria, Sierra Leone and Togo.

irrigation infrastructure development was made by the government during the years 1970–1980. The Government of Nigeria invested about US\$ 3 billion in irrigation development over a period of two decades, through River Basin Development Authorities (RBDAs) which are parastatal agencies of the Federal Ministry of Agriculture, Water Resources and Rural Development (this amount does not include the money expended on irrigation development through Agricultural Development Projects). Under this program, dams and major structures of many systems have been constructed although the irrigation distribution network remains to be completed. As of 1991, the total irrigated area under large-scale irrigation was only 70,000 ha. However, the area under public sector irrigation is expected to increase considerably by the end of 1992. The low performance of the large-scale irrigation systems reflects a shortfall between the achievement and the target set out in the National Development Plan of Nigeria.

### Technologies Adopted for Small-Scale Irrigation Development

In the late 1980s, a new program designed to develop small-scale, farmer-based, privatized irrigation systems in Fadama lands for wheat and vegetable cultivation, especially during the dry season, was implemented by the government through the Agricultural Development Projects (ADPs). Fadama is low land flood plains or valley bottoms with a high water table. The technologies adopted for irrigation development in these lands included water lifting from streams or rivers with the help of small or large pumps depending on the size of the land to be irrigated. Construction of ponds and wells and small earthen dams, and installation of washbore or shallow tubewells (STWs), were undertaken as part of the development program. Most of these systems are managed by the beneficiary farmers themselves. The Nigerian Government's policy promoted small-scale irrigation for farming of winter crops such as wheat

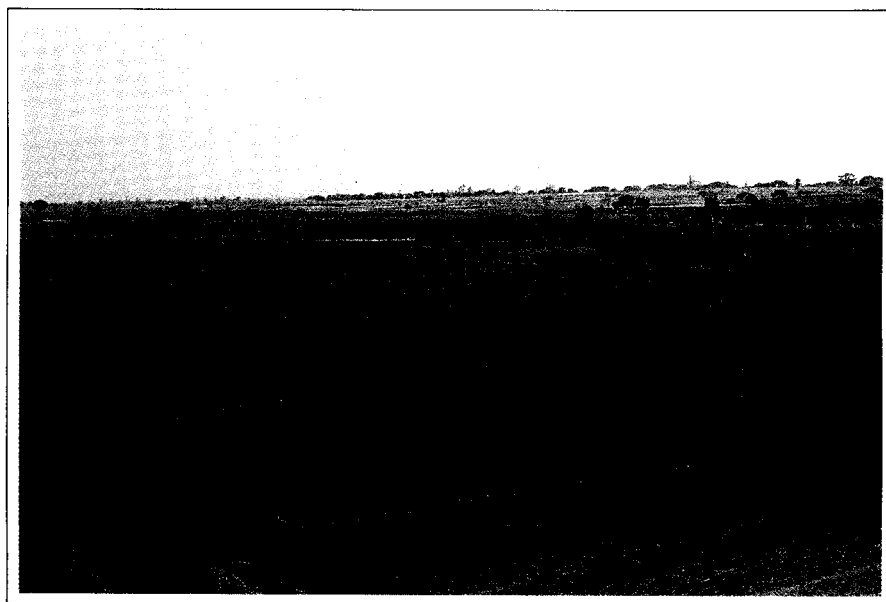
and vegetables, especially in the northern States of Sokoto, Kano, Katsina and Bauchi.

Valley bottom irrigation systems for rice cultivation are prevalent in the central zone of the country. These irrigation systems are constructed to divert water from the valley bottom streams to the rice fields. There are different techniques of irrigation used before and after the flood plain and such systems could be found around Bida in the Niger State. Many of these systems are managed by the farmers

consideration in small-scale irrigation is the process developed by the agencies to assist farmers develop their systems.

### Agencies Responsible for Irrigation Development

There are three public sector agencies responsible for irrigation infrastructure development in Nigeria: the State Ministry of Agriculture and Rural Development; Directorate of Foods, Roads and Rural Infrastructure (DFRRI); and River Basin Development Authorities (RBDAs). The State



Wheat field in Fadama area, Zaria.

themselves. However, the State Government has provided occasional assistance for improvement of these systems. It has been identified that vast potential exists for improving agricultural production in these areas through appropriate assistance programs for better water management. (A-M Izac. *et. al.* 1991).

The potentiality of small-scale irrigation development in Nigeria is tremendous. Over one million ha of Fadama land can be developed for irrigated agriculture. This needs to be considered from the point of view of initiating appropriate technology, both efficient and economical, to the farmers and developing a suitable institutional base at the farmer level. The important issue to be taken into

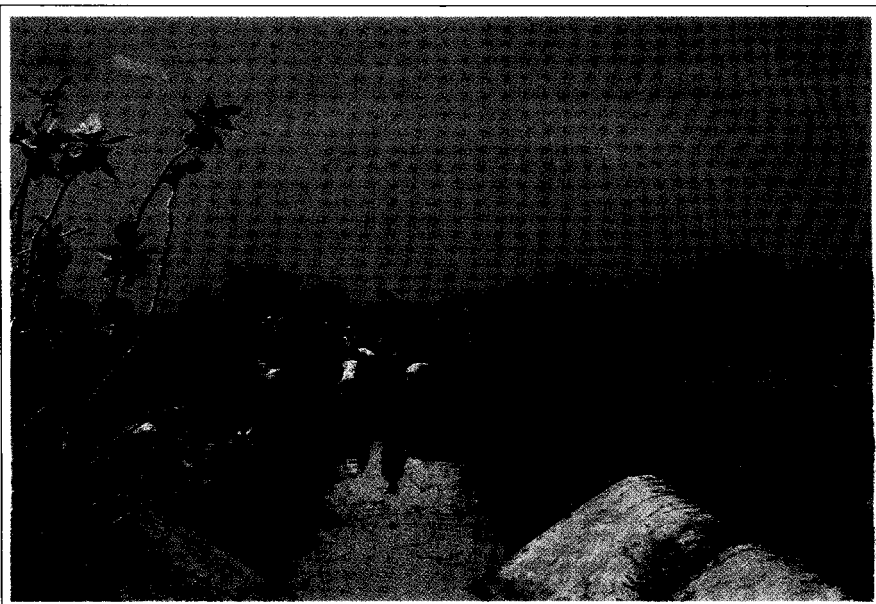
Ministry of Agriculture and Rural Development implements irrigation infrastructure development programs through the provision of credit to small scale-farmers for construction of boreholes, installation of STWs, and purchase of pumps and also through the construction of medium-scale irrigation systems. Small-scale (less than 50 ha) and medium-scale (50-2000 ha) irrigation systems come under the jurisdiction of the State Ministry of Agriculture. Parastatal institutions such as Kano Agriculture and Rural Development Authority (KNARDA) were established with a view to promoting agriculture and irrigation development in the states. Although DFRRI also has a mandate for small-scale village-based irrigation system development it plays a more

active role in potable water schemes. RBDAs are responsible for the construction and management of the large-scale irrigation systems.

Water is a scarce resource in northern Nigeria. Therefore, it needs to be conserved and better utilized. Consequent to the severe drought that prevailed during the period 1972–1974, 11 River Basin Development Authorities were established with responsibilities for developing infrastructure for irrigation, increasing agricultural production and undertaking rural development activities in systems with a command area of above 2,000 ha. However, the performance of these irrigation systems under the RBDAs, was marred due to shortfalls in achieving their area targets, operating only at 50 percent efficiency, wastage of water, lack of beneficiary participation, deterioration of structures, lack of maintenance of the systems and shortage of spare parts for the maintenance of machinery. It is reported that the main reason for the poor overall performance of these systems is a lack of funds. Although RBDAs were initially formed with multiple functions, at present, they are only responsible for water-related activities and are no longer involved in production and agriculture-related programs.

### **New Policy Thrust**

The commercialization and privatization policy adopted by the government in 1987, as a package of the Structural Adjustment Program (SAP), has made the River Basin Development Authorities (RBDAs) to be partially commercialized. With the implementation of this program, the cost of services provided by the RBDAs is no longer subsidized but has to be borne by the beneficiaries themselves. Hence, the policy of commercialization and privatization has brought about institutional re-organization in the legal system of irrigation management, in the role of users' organizations, in water charge collection, and in sharing of responsibility jointly by the agency and the farmers for the operation and maintenance of the system. The govern-



*Farmers busy cleaning the distributary canal at Karfi, KRIS.*

ment will provide funds for the construction of the infrastructure while the completed irrigation systems have to mobilize resources internally to meet the recurrent costs of operation and maintenance of the system.

### **IIMI-HJRBDA Action Research Program**

The Hadejia Jama'are River Basin Development Authority (HJRBDA) is responsible for the construction and management of the Kano River Irrigation Project (KRIP) in Kano, northern Nigeria. The Project is being developed in two phases. Under Phase I, 22,000 ha of irrigation system will be developed; of this 15,000 ha have already been fully developed. The second stage will concentrate on the development of another 40,000 ha.

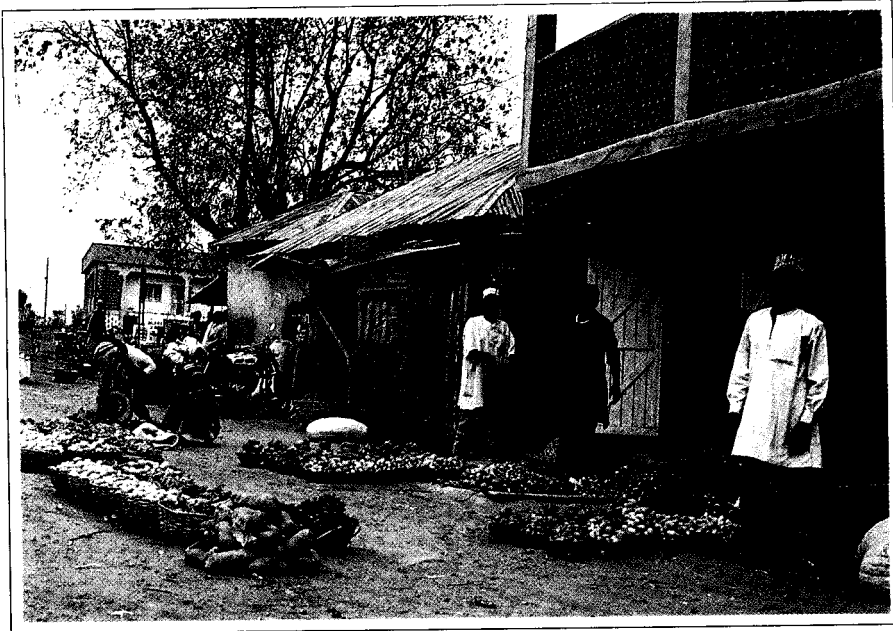
Agricultural production and crop coverage in KRIP have increased over time as a result of farmers adopting irrigated agriculture as a viable alternative to rain-fed agriculture. The system has achieved a high cropping intensity due to the availability of irrigation facilities. During the wet season, 50 percent of the area is under rice. Farmers also plant non-rice crops such as sorghum, millet, maize, cowpea and vegetables during this period. KRIP has large areas under wheat during the dry season and a smaller area under maize and other crops.

The privatization and commercialization policy adopted by the Government of Nigeria in 1987 aims at handing over public-sector enterprises to private-sector management. This has resulted in a change in the mode of management of irrigation systems from agency-management to joint-management. In the latter, both agency personnel and farmers become partners and share the responsibility of management and resource mobilization. The new policy also calls for the transfer of increased responsibilities for operation and maintenance of irrigation systems to users.

HJRBDA, in collaboration with IIMI, has undertaken action research to support the turnover of management of irrigation systems to their users. This program, currently underway in KRIP, will be used as a model to assist the RBDAs in establishing agency-farmer joint-management systems in other irrigation projects.

The HJRBDA-IIMI Collaborative Action Research Program in KRIP focuses on four issues:

\* **Institutional Aspects.** This action research component is directed at strengthening the institutional support for irrigation management. It addresses such issues as legal provision for the role of the farmers, legal basis for farmer organizations in



*Tomato vendors in Kano.*

relation to water management, and procedures to form water users' organizations.

**\* Changes in Mode of Management.** The transition from agency-management to joint-management requires a change in the existing power structure of the

agency. In order to help make this transition, re-orientation programs for the farmers and officials are being organized to discuss ways and means of implementing joint-management.

**\* Operation and Maintenance (O&M) Procedures.** This is an important area which needs an

analysis of the work to be done and costs and responsibilities to be shared. The O&M procedure concerns farmer organizations as well as resource mobilization.

**\* Resource Mobilization.** Internal resource mobilization is a prerequisite for better operation and maintenance of irrigation systems. This research component includes an analysis of alternative sources of resources and the development of a procedure for the collection of a higher percentage of water fees as these are the major sources of revenue for KRIP.

The expected outputs of the program are a greater awareness among irrigation managers and users regarding the requirements for successful joint-management of irrigation systems, establishment of procedures for joint-management, recognition of users' organizations, and improvement in the operation and maintenance of the system. The lessons learned will be relevant for other systems in Nigeria.

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